QAD 2007 User Guide Volume 8A
Service/Support Management

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This guide consists of two volumes, which cover features of the QAD 2007 Service/Support Management (SSM) module.

Each chapter documents a key service topic. Chapters are ordered based on how you would implement SSM in QAD 2007. Setup issues are discussed first, followed by service relationships (contracts and warranties), calls and call related issues, and finally topics related to managing item repairs.

Other QAD Documentation

- For an overview of new features and software updates, see the *Release Bulletin*.
- For software installation instructions, refer to the appropriate installation guide for your system.
- For conversion information, refer to the *Conversion Guide*.
- For instructions on navigating and using the QAD .NET User Interface, see *User Guide: QAD .NET User Interface.*
- For instructions on navigating the Windows and character environments, refer to *User Guide Volume 1: Introduction*.
- For instructions on navigating and using the QAD Desktop interface, see *User Guide: QAD Desktop.*
- For information on using QAD 2007, refer to the *User Guides*.
- For technical details, refer to *Entity Diagrams* and *Database Definitions.*
- To view documents online in PDF format, see the *Documents on CD* and *Supplemental Documents on CD*.

  Note Installation guides are not included on a CD. Printed copies are packaged with your software. Electronic copies of the latest versions are available on the QAD Web site.

For a complete list of QAD Documentation, visit the QAD Support site.

Online Help

QAD 2007 has an extensive online help system. Help is available for most fields found on a screen. Procedure help is available for most programs that update the database. Most inquiries, reports, and browses do not have procedure help.

For information on using the help system in the different QAD 2007 environments, refer to *User Guide Volume 1: Introduction, User Guide: QAD Desktop,* and *User Guide: QAD .NET User Interface*.

QAD Web Site

QAD's Web site provides a wide variety of information about the company and its products. You can access the Web site at:

http://www.qad.com

For QAD 2007 users with a QAD Web account, product documentation is available for viewing or downloading at:

http://support.qad.com/

You can register for a QAD Web account by accessing the Web site and clicking the Accounts link at the top of the screen. Your customer ID number is required. Access to certain areas is dependent on the type of agreement you have with QAD.

Most user documentation is available in two formats:

- Portable document format (PDF). PDF files can be downloaded from the QAD Web site to your computer. You can view them with the free Adobe Acrobat Reader. A link for downloading this program is also available on the QAD Web site.
- HTML. You can view user documentation through your Web browser. The documents include search tools for easily locating topics of interest.

Features of ServiceLinQ also include an online searchable solution database to help answer questions about setting up and using QAD products. Additionally, the site has information about training classes and other services that can help you learn about QAD products.

Conventions

QAD 2007 is available in several interfaces: the .NET User Interface, Desktop (Web browser), Windows, and character. To standardize presentation, the documentation uses the following conventions:

- QAD 2007 screen captures show the Desktop interface.
- References to keyboard commands are generic. For example, choose Go refers to:
  - The Next button in .NET UI
  - The forward arrow in Desktop
  - F2 in the Windows interface
  - F1 in the character interface

  In the character and Windows interfaces, the Progress status line at the bottom of a program window lists the main UI-specific keyboard commands used in that program. In Desktop, alternate commands are listed in the right-click context menu. In the .NET UI, alternate commands are listed in the Actions menu.

  For complete keyboard command summaries for each interface, refer to the appropriate chapters of *User Guide: QAD .NET User Interface, User Guide: QAD Desktop* and *User Guide Volume 1: Introduction.*

This document uses the text or typographic conventions listed in the following table.

If you see:	It means:
`monospaced text`	A command or file name.
`italicized monospaced text`	A variable name for a value you enter as part of an operating system command; for example, *`YourCDROMDir`*.
`indented command line`	A long command that you enter as one line, although it appears in the text as two lines.
Note	Alerts the reader to exceptions or special conditions.
Important	Alerts the reader to critical information.
Warning	Used in situations where you can overwrite or corrupt data, unless you follow the instructions.

Chapter 1

Introduction to SSM

This chapter introduces business issues of customer service. The first part discusses differences between the service and the manufacturing perspective. The second part introduces business concepts unique to service environments. Next is an overview of how the Service/Support Management (SSM) module is organized and how it integrates with other aspects of QAD 2007.

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What Is Unique About Service?

Service is usually the only way, other than product sales, for a manufacturing company to produce revenue. However, the way service revenue is produced differs from the way sales revenue is produced. Many individuals familiar with manufacturing have to adjust their thinking to see the service perspective.

Differences between sales and service extend through the setup of the service organization and affect business decisions you make at every level. In a service environment, classical manufacturing concepts can mean something entirely different. For example, a service price list determines the price of servicing an item, not the price of the item itself.

Another difference that is significant to service is an end-user orientation. End users are often the starting point for service decisions. In the rest of the manufacturing environment, however, delivering to a user represents the completion of activity. To accommodate this difference, many people think about service in reverse to how they think about the rest of manufacturing.

For example, in the rest of manufacturing and distribution activity, your software manages shipping *to* the customer. This is the result of planning, fabrication, and delivery. Service activity, however, can start with the shipping of an item back to you. Your software manages the shipment of a return *from* the customer.

Even if you manage distribution with similar functions, interface, and procedures as the servicing of returns, the direction of flow is the opposite.

Service: The Competitive Advantage

Companies in manufacturing and supply chain sectors can leverage a well-managed service and support strategy into long-term competitive advantages such as the following:

- *Service contracts provide ongoing revenue.* Probably the most obvious advantage is that service contracts provide revenue long after the original sale.
- *Service builds sales.* Manufacturing companies are discovering that service can drive sales or help penetrate new markets. Personal computers are a classic example: better service and support were critical to penetrating larger, less technical markets.
- *Service builds markets.* Service can help build long-term customer relationships and long-term customer loyalty. In this way, service helps build markets, not just sales.
- *Service can recoup quality control costs.* If quality control brings service costs down, profits from service contracts increase without impacting pricing. This is especially beneficial in markets where a considerable time exists between quality improvements and market recognition of them at a level that supports a price increase. Increased profits from service provide payback during this time.
- *Service can drive technology.* Those who service a product often learn as much about how it works as those who built it. Proper management of this service experience through a service request system can drive new product development. Historically, in sectors such as aerospace, automotive, and electronics, servicing competitors' products has been a key to major innovation and technology transfer.

Basic Service Business Concepts

This section introduces business concerns of service organizations that may differ from those in the rest of manufacturing. Concepts are presented in the order they typically occur during implementation. Later chapters explain the concepts in more detail.

Installed Base

The first business decision in service is *what* you are going to service. Will you service only what you make or also items manufactured by other companies? Will you service only items you sell directly or any item you manufacture, regardless of the distribution channel producing the sale?

A key concept in these decisions is the installed base. An installed base record matches end users with specific items and can control service policy. Whether you decide to service only the installed base or some other mix of items shapes your service business.

Level of Service

Once you decide what to service, you decide *how much* service to provide. What level of service are you providing and for which situations? A level of service typically is a percentage of either labor, item, or expense service costs.

Limits of Service

Typically, you explicitly limit service in terms of time and total service cost. The level of service and its limits represent the *level of coverage*. How much is an item covered for, and for how long? Does this coverage include replacement parts, labor, expenses for on-site visits, shipping?

Defining the level of coverage helps you effectively manage extra charges, as well as billing for labor and costs not covered, or partially covered. Service limits help you distinguish billing for different aspects of service, such as labor, parts replacement, and service expenses.

Service limits can include time limits, overall cost limits, and limits for specific items. For example, in SSM, you can set a maximum amount of service—all costs up to $1,000—limit coverage for a category of work—labor up to $1,000—or limit service on specific items—drive train not included.

Contractual Obligations for Service

You define and control service coverages by an agreement with your customer. This agreement states explicitly the level of coverage you are providing and takes the form of a warranty or a service contract.

A warranty typically does not produce revenue and is shorter in duration than a contract—often measured in days. You usually do not renew a warranty. Instead you replace it with a service contract.

Service contracts usually produce revenue, work over a longer time—often months or years—and are often renewable. Both warranties and service contracts explicitly state the level of service and its limits.

Service activity flows from the obligations in the warranty or service contract and continually refers back to these agreements when determining service response and billing.

Pricing for Service

Service organizations usually have separate pricing. A manufactured item needs a price list for *service* as well as sale of the item. Organizations selling service contracts need price lists for contract coverage and for service activities.

You may also need price lists for returned items you repair or refurbish and send back to customers. If you give credit for returns, you probably do not want to offer full price for the used item. A credit price list with lower prices takes into account the wear or age of the returned item.

Billing for Service Contracts

Tip
Billing after the fact is called *billing in arrears*.

Since service contracts generate revenue, you need to decide how you are going to bill for contract coverage. The primary decision is whether to bill for service before you do it, or after. There are advantages and disadvantages to each approach, depending on the type of service. Also important is how often you bill, or the *billing cycle*, which determines when invoices are generated.

Call Management

Once you define what you are servicing and how much service you are providing, you need mechanisms for managing that service activity. You usually manage service and support activity through *calls*.

A service call may mean a phone call from a customer, a service visit, a call by a field technician, or any other contact with a customer or potential customer. A service call is contact that generates a service response, even a brief response to a customer's question.

The call labels the service situation, and *call management* provides processes and tools for managing the service contact. You *close* a call when you have resolved the customer's service problem.

Call Activity Recording and Call Invoicing

Calls can reflect a broad range of issues and problems. Part of call management is tracking the actions taken by an engineer to resolve an assigned problem. This includes recording the hours and kind of labor performed, any expenses incurred, and any service items consumed or returned.

This detailed record of activity is the basis of call billing. Service may be covered by a warranty or contract, or you may charge for it. Some organizations offer *fixed price* service. In this case, you charge a single, predetermined price for the service activity, regardless of the actual cost of time and material. An organization may choose to cover part or all of the cost of service as a goodwill gesture. These scenarios represent different ways of charging for service that tie into accounting and invoicing.

Service Quotes

Many service organizations require a quotation process in selling services to prospective customers. Quotations state the cost of a service contract or the cost of service activity generated by a call. A call quote outlines the labor, expenses, and replacement items required for service or repair work.

Queue and Escalation Management

Call management uses queues to categorize calls and assign them to service personnel. In some cases, the system forwards calls if you do not close them within a certain time. This forwarding is *call escalation*.

Call escalation tries to ensure that you resolve calls within defined rules. If a call is not solved, the system escalates it to a more visible queue, often managed by more highly skilled service personnel.

Each service organization must set up these queues based on business requirements. Once a queue structure is established, decide if you need call escalation. If you do, carefully plan the call escalation sequence.

Engineer Scheduling

Once you establish queues and escalation sequences, most service organizations need a controlled method for assigning service personnel to calls. SSM provides powerful engineer scheduling based on a point system. Your criteria for assigning points is used to recommend engineers to assign to calls.

Service Inventory

Tracking service inventory can pose special problems. You may manufacture some items used in service and already track them in inventory. Others you may need to set up.

Service inventory can be complex, including everything from tool kits to replacement parts to consumable items such as inks, fillers, reactants, and lubricants. Storing service inventory in multiple diverse locations—such

as mobile field units, repair centers, service supply depots, workshops for refurbishing items—adds complexity. You also need to track items you return to *your* suppliers.

SSM has mechanisms for tracking and managing these situations. They are woven into the call activity recording, material orders, return material authorization (RMA), and return to supplier (RTS) functions.

Installation Service

Some equipment requires a technical professional to complete the installation. This need is addressed by an interface between sales orders and service. You can generate an automatic installation call when an item requiring installation service is sold.

Preventive Maintenance

While most service activity is in response to a breakdown, a company can try to prevent failure by offering *preventive maintenance*. Preventive maintenance is servicing an item at regular intervals *before* it breaks down, in the hope of preventing failure.

In industries such as aerospace manufacturing, preventive maintenance is an obvious necessity. In other industries, such as copiers, preventive maintenance has become standard. Preventive maintenance requires prescheduling preventive maintenance calls and supplying the personnel and inventory necessary. SSM fully supports preventive maintenance.

Returns and Repairs (Refurbishment)

Many service and support organizations have to process returned items. This requires a series of business decisions: Do you immediately ship back a new item and refurbish the return? How do you use the refurbished return? Do you refurbish the return and then ship it back? Do you offer loaner items while the returned item is repaired? Do you choose not to refurbish and ship back only new items? Do you ship a replacement item to your customer before the return is shipped to you? These decisions depend on your products and how critical they are to your customer.

Service Requests

SSM offers service request capabilities. Service requests report service experience to the rest of an organization. Typically, service requests record engineering changes and other suggestions from the customer base and from the service organization.

Service experience is then used for product improvement, process improvement, marketing adjustments, and strategic product decisions. In this way, service and support provide both revenue and valuable product experience.

Organization of the SSM Module

Service/Support Management sets up and manages the interactions required for supporting, maintaining, or repairing items, whether they are covered by warranty or service contract. The User Guide is organized around the primary functions of service and support: setup, warranties and contracts, calls, and service activity.

Setup

Setting up SSM depends on your implementation decisions. The three main areas are:

- *Installed Base.* Whether or not you maintain an installed base and how much detail you maintain in it impacts service activity.
- *Control Codes.* You manage the flow of service activity with combinations of control codes defined prior to using SSM. You tailor SSM functions with these codes and various control program settings.
- *Price Lists.* Service price lists determine prices for contracts and call invoicing.

Warranties and Contracts

Service types and warranties define basic relationships with your customers. The terms and conditions associated with service types drive service activity. Limits and levels of coverage determine how much you charge for service.

Service contracts define a particular relationship with an individual customer. The terms and conditions of the contract are based on a contract type, but you can tailor them for an individual customer. The contract's life cycle may begin with a quote, move to the contract, involve billing and invoicing, and continue with contract renewal or delete/archive functions. Contracts control the automatic scheduling of preventive maintenance calls.

Call Tracking

The service organization typically uses calls to manage customer contact and track service activity. Call management functions include engineer scheduling, escalation sequences to ensure timely response, and creating service requests for managing long-term product design issues.

Managing Service Activity

Product Structures and Routings

Service product structures and routings specify the components required in a service activity and the sequence of steps to follow. You can define multiple service BOMs and routings for different activities, such as installation, preventive maintenance, and repairs. BOMs and routings streamline the process of recording activity for a call and can be used to manage repairs in a repair center.

Call Activity Recording and Invoicing

Call Activity Recording tracks the service activity that results from response to a call. Material orders (MOs) manage inventory consumed on a call. Once activity is complete, Call Invoice Recording creates billing for service activity.

RMAs and RTSs

Service organizations can manage the return, replacement, and shipment of items using return material authorizations (RMAs). You can release the RMAs to a repair work order to be completed in a repair center. Returns to suppliers (RTSs) manage items that must be repaired by another organization.

General Service Work Flow

The four functional areas illustrated in Figure 1.1 determine a natural flow and logical progression from:

1. Defining the codes controlling service limits and variables to...
2. Defining the service relationship with the customer to...
3. Managing the contact that results through a call to...
4. Managing the physical response to a customer need, including repairs, installation, preventive maintenance, and returns.

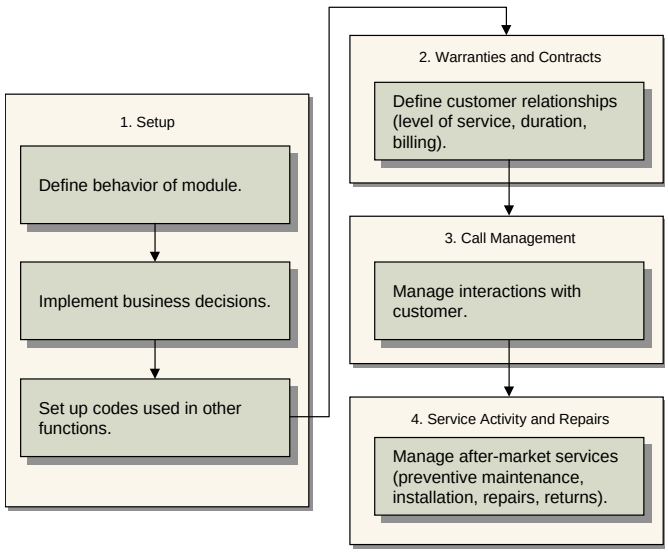
1. Setup
Define behavior of module.
Implement business decisions.
Set up codes used in other functions.
2. Warranties and Contracts
Define customer relationships (level of service, duration, billing).
3. Call Management
Manage interactions with customer.
4. Service Activity and Repairs
Manage after-market services (preventive maintenance, installation, repairs, returns).

Fig. 1.1
General Work Flow in SSM

All service activity is driven by the relationships defined in the warranty, contract type, or service contract supplying the terms of coverage for a particular activity.

Interactions with Other Modules

Service/Support Management relies heavily on information that is set up and managed in other QAD 2007 modules. Figure 1.2 illustrates how SSM draws on data from other modules. In the figure, striped modules are optional; solid modules are required to run SSM. Arrows indicate the direction of data flow.

Fig. 1.2
SSM and Other QAD 2007 Modules

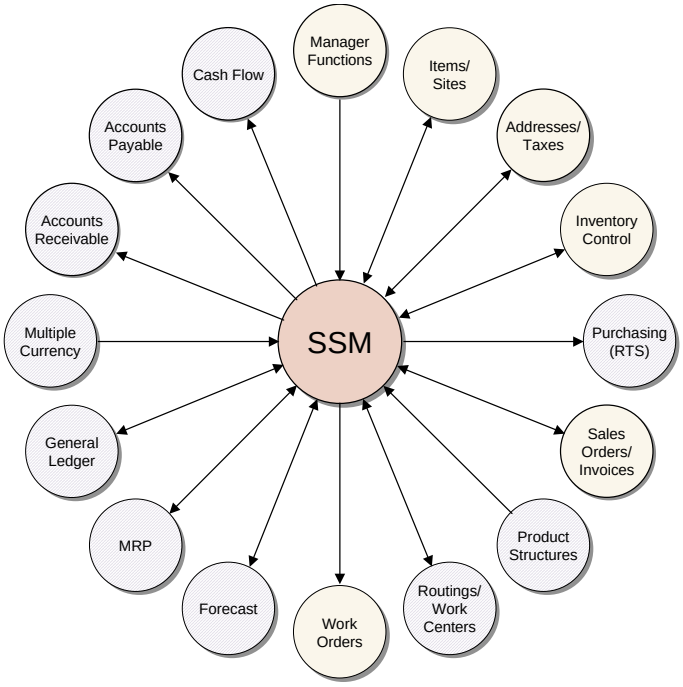

Table 1.1 summarizes these relationships. SSM uses the data listed in the second column in various service functions. The column labeled Data Output by SSM indicates ways that service functions may modify data managed in other modules.

Table 1.1
SSM Interaction with Other Modules

Menu		Data Used by SSM	Data Output by SSM
1.	Items/Sites	Item records, item/site records, locations, location statuses, product lines, product line accounts, price lists for RMAs and RTSs, master comments, units of measure, compliance features	Item service attributes
2.	Addresses/Taxes	Customers, credit limits, vendors, suppliers, bill-tos, ship-tos, employees, salespersons, trailer codes, tax environments, credit terms, freight charge, Intrastat activity	End users (type of customer record), engineers (type of employee), customer open balance, Intrastat data for RMAs, RTSs, and material orders.
3.	Inventory Control	Inventory balances	Inventory transactions: issues, transfers, unplanned receipts, unplanned issues, ORD-SO, ISS-SO, ORD-PO, RCT-PO, ISS-WO
5.	Purchasing	None	RTSs are a type of purchase order
7.	Sales Quotations/ Orders/ Invoices	Source for contract quote and contract line items Installed base updates from Invoice Post Installation calls from sales order shipments Sales Order Control settings (RMAs and material orders) Credit hold/removal for RMAs	Coverage for quoted item RMAs and MOs are a type of sales order. Call and contract invoices represent types of sales order invoices. Invoices for calls, contracts, and RMAs are printed and posted here.
8.	Configured Products	Source for information in installed base Can be used in RMAs	Installed base records created from posting sales orders for configured products
13.	Product Structures	Standard BOM as source for service BOM	Service BOMs
14.	Routings/Work Centers	Standard work center (for labor rate)	Service work centers
16.	Work Orders		CAR reports RMA release to work order

Menu		Data Used by SSM	Data Output by SSM
22.	Forecast/Master Plan	Forecast	Forecast consumption from RMA issue lines and expensed MOs
23.	Material Requirements Plan		Gross requirements from RMAs, CAR, MOs
25.	General Ledger	Accounts, sub-accounts, cost centers, projects	GL transactions from call, RMA, and contract invoices, MO shipments between sites
26.	Multiple Currency	Currencies, exchange rates, and rounding methods	
27.	Accounts Receivable		Amounts from call, RMA, and contract invoices
28.	Accounts Payable		RTS payables
31.	Cash Management		Service invoices for Cash Flow Projection Report
36.	Manager Functions	System accounts, generalized codes, language codes, security, printer setup, batch processing	

SSM's specific interactions with other QAD 2007 modules are discussed in the relevant sections of this User Guide.

Chapter 2

Installed Base

Service/Support Management (SSM) enables service organizations to maintain information about the products they sell or service and the individuals who own them. Collectively, this information is the *installed base* (ISB). This chapter introduces business considerations related to the installed base and describes how to manage it.

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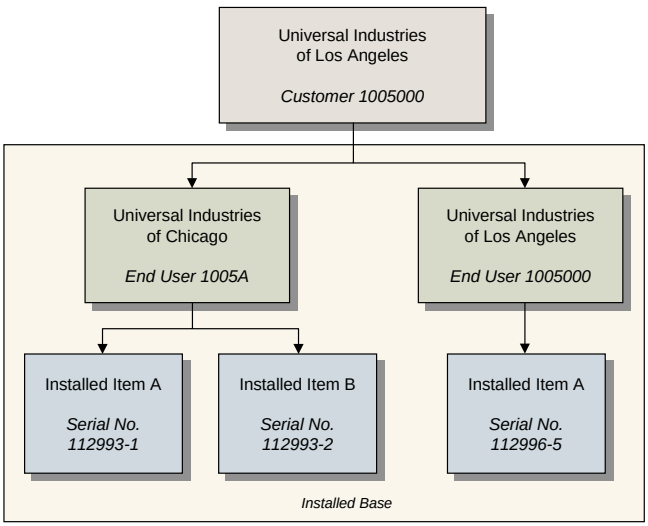
Understanding Basic Terms

The installed base is a repository of information about items and the organizations that own and use them. An installed base record links three essential elements: an item, the customer who purchased it, and an end user. It also maintains details about an item, including serial number, installation date, warranty coverage, and how often maintenance is required.

The customer is the organization that purchased the item, and represents the parent record to which end users and installed items relate. Each end user must be linked to a customer and, in turn, each installed item must be linked to an end user. As shown in Figure 2.1, the customer can also be an end user.

Fig. 2.1
Installed Base Records



When the installed base is updated from sales orders, the customer is the sold-to address in Sales Order Maintenance. If you do not sell directly to customers but market your products through retail outlets, you can define a single customer record to use as a place holder in this relationship.

End users are the people who most often use an item, request maintenance for it, and report problems. When the installed base is updated from sales orders, the end user is the ship-to address in Sales Order Maintenance (7.1.1). The end user is not necessarily the customer.

Each customer can have many end users, but a given end user is linked to only *one* customer. Typically, the end user possesses the item, even though it might have been purchased by the main office.

Example A parent company buys a forklift and ships it to a warehouse. The parent company is the customer. The warehouse is the end user. The warehouse did not buy the forklift, but uses it at that location. Someone at the warehouse usually reports service problems.

In QAD 2007, a customer can also be the end user, but an end user *cannot* exist by itself—it must be linked to a valid customer record. The end user is always connected to the customer who purchased the item that the end user possesses.

Business Considerations

When implementing Service/Support Management, you must decide if you need to track an installed base. If you decide to track an installed base, you must further consider:

- How detailed should the installed base records be?
- What is the relationship between the installed base and service call policy?

Your answers to these questions affect many other business decisions.

Should You Track an Installed Base?

The installed base consists of records that combine an item with an end user. To maintain the integrity of these records, items must be uniquely identified in the installed base. If you add an item that is not serial number or lot number controlled to the installed base, the system creates unique identifiers by using an installed base reference number. However, this may not effectively identify the item when you provide service for it.

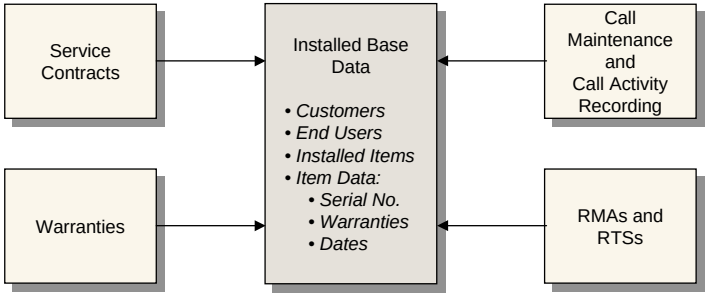
Tip
Tracking an installed base is best suited for items controlled by serial or lot numbers.

Example Two warranted air conditioners are installed simultaneously at an end-user location, and identified with ISB reference numbers 1 and 2. When the end user calls with a problem, the caller cannot easily identify which of the air conditioners requires service. This makes it hard for the service organization to tie the request to a particular item.

You do not need an installed base to use Service/Support Management. However, most service activities refer to and can derive important information from it. Figure 2.2 illustrates how the installed base is central to service functions.

- Service contracts can be built items in the installed base.
- Warranties apply to items in the installed base.
- Call Maintenance and Call Activity Recording derive coverage information from installed base data.
- RMAs and RTSs can reference specific serial numbers in the installed base.

Fig. 2.2
Service Functions Referencing the Installed Base



Answering the following questions can help you decide if you should implement an installed base:

- Can you identify the items you service with a unique serial or lot number?
- Do you offer aftermarket services of any kind for items sold?
- Do you register products? Do you service only registered products?
- Do you offer warranties?
- Do you offer product upgrades?
- Are your products subject to recall?
- Do any of your products require scheduled maintenance?
- Do you need a complete audit trail for a government or supervisory agency, common in the medical market?

A yes to any of these questions indicates that you need to track an installed base in some way.

Important If you offer warranties, you *must* track items in the installed base. Warranties only apply to installed base items.

What ISB Details Are Required?

The answers to the previous questions also indicate how detailed the installed base records should be and which details are important.

For example, if you offer warranties from the date of purchase, your installed base records need a date of purchase for each item sold. If you limit the warranty to customers who register the product, you need to track which items are registered.

Detail also addresses coverage of the components of an item. Especially with configured products, certain options may have warranty coverage distinct from the parent item.

How Should the ISB Affect Service Policy?

Apart from the obvious advantages of knowing what you have sold and to whom, you can use the installed base to control service activity. For example, you can refuse service calls for items not in the installed base. The installed base serves as a validation database, since certain programs, such as Call Maintenance, Contract Maintenance, and RMA Maintenance, depend on what is there.

A primary business decision when implementing SSM is determining how the installed base should relate to service policy. Other decisions flow from this major one. There are three basic approaches:

- Limit service calls to an installed base of items you manufacture, distribute, or sell—items already in your item master.
- Limit service calls to an installed base, but include items in the installed base that are not in your item master.
- Do not consider the installed base when taking calls.

Each service organization must set up SSM according to one of these three practices.

End Users

End-user information helps identify items in the installed base. You create end users:

- Directly with End User Address Maintenance
- Indirectly through the interface between service and the Sales Orders/ Invoices module
- From other service functions like Call Maintenance, Call Quote Maintenance, RMA Maintenance, and Contract Maintenance

When you create an end user directly, you can specify a greater amount of detailed service information than when you do it indirectly.

The engineer scheduling function in Call Maintenance awards points to engineers based on how certain attributes of the engineer match the end-user record. Area and primary and secondary engineer are important for scheduling. If you plan to use engineer scheduling, it is important to define these attributes correctly for each end user.

This section first discusses creating end users directly with End User Address Maintenance, and then creating them indirectly.

End User Address Maintenance

Use End User Address Maintenance (11.9.1), illustrated in Figure 2.3, to add a batch of new end users to the system, such as when processing product registration cards.

Other typical uses of End User Address Maintenance include:

- Adding data for end users created with other functions
- Adding contacts for an end user as they become known
- Storing a message associated with the end user for a specific period
- Deleting obsolete records

You cannot delete an end-user record that is referenced by an open call, a service quote or contract, or service request. The customer associated with an end user cannot be deleted if end users exist for that customer.

Adding Other Address Codes as End Users

If an address code was created by another address maintenance function such as Customer Maintenance or Customer Ship-To Maintenance, you cannot modify the address information with End User Address Maintenance. You can add end-user details but must change the address with the maintenance function where it was created. End users created indirectly as a result of Invoice Post are created as customer ship-to addresses and must be maintained there.

Tip
You can change the Sort field, since it can be different for each end user.

End User Frame

When you specify a customer in End User Address Maintenance, the fields in the Customer Address frame default from the customer record in a display-only mode. Add end-user address information in the End User frame. This information is similar to what you enter in Customer Maintenance.

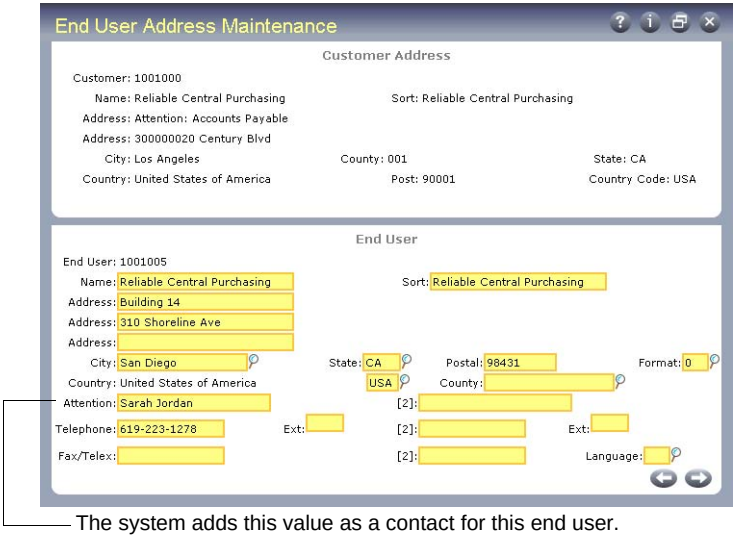


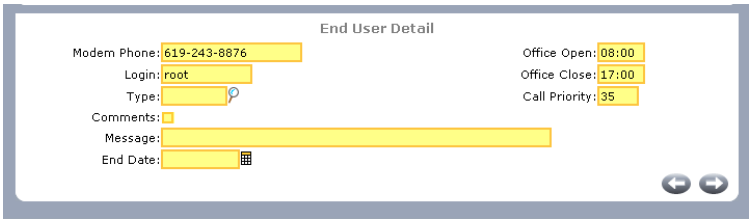
Fig. 2.3
End User Address Maintenance (11.9.1)

The individual in the Attention field is a primary contact and displays by default in the Caller field of Call Maintenance when you create new calls for this end user. You can add additional contacts in the Contacts frame, each with a unique telephone and fax number.

End User Detail Frame

The End User Detail frame displays next, where you specify details related to this end user that affect other service activities.

Fig. 2.4
End User Detail Frame



Tip
Enter a modem number for companies that provide software or hardware support. Performing remote diagnostics via modem can save time and expense of an on-site visit.

Modem Phone and Login. Specify an optional phone number for the end user's modem and a login user ID. These fields are for reference and may appear on some reports and inquiries.

Type. Enter an optional code set up with Generalized Codes Maintenance for field eu_type. End-user type codes group end users in categories. You define warranty types and default charge codes based on the end-user type: You might have one warranty for priority end users and one for regular end users. Or you might categorize foreign and domestic end users using the end-user type field.

Office Open and Close. Enter the hours during which this end user usually conducts business in order to ensure that service is scheduled appropriately.

Tip
Lower numbers indicate a higher priority.

Call Priority. Priority indicates the importance to assign to calls from this end user. If you specify a nonzero value, it displays as the default in Call Maintenance (11.1.1.1). The end-user priority takes precedence over the priority associated with any contract or warranty in effect for this end user, or the priority defined as a user preference.

See Chapter 4, "Multiple Time Zones," for details.

Time Zone. This field displays when Multiple Time Zones is active. It defaults from the end user's customer if a value has been defined there; otherwise, it defaults from Server Time Zone in Service Management Control. Enter a time zone defined with Multiple Time Zones Maintenance (11.21.22.1).

This field determines how times are displayed and stored in Call Maintenance when a call for this end user is taken. The end user's time zone also affects engineer scheduling, service coverage, and service pricing.

You can only update this field when you create an end user. After an end-user record exists, change the time zone with the End User Time Zone Change Utility (11.21.22.20). This utility updates calls for the end user to reflect the new time zone.

Message. Enter an optional, short message regarding this end user that displays in various call-related programs for calls associated with this user. For example, when you create a call or record service activity, the message displays at the bottom of the window. It also appears on printed calls, which the engineer often uses as a kind of work order.

End Date. If the message becomes obsolete after a certain date, enter that date in this field. When the system date matches or exceeds the end date, the message no longer displays.

Service Office Detail Frame

The Service Office Detail frame stores information for assigning and scheduling engineers for this end user, as well as managing calls.

When you associate a primary or secondary engineer with an end user, the system checks settings in Engineer Schedule Control. A warning displays under these conditions:

- If Limit by Service Area is Yes and the engineer's service area does not match the end user's area
- If Limit by Time Zone is Yes and the engineer's time zone either does not match the end user's or is outside the range in Range of Hours to Consider

Tip
To limit by time zones, MTZ must be active.

Fig. 2.5
Service Office Detail Frame

Engineer Code. This code specifies the engineer usually assigned to calls for this end user—perhaps the one closest to this end-user site, or the one preferred by the customer. The engineer scheduling function in Call Maintenance awards points to this engineer based on twice the Primary Eng Points field in Engineer Schedule Control.

Secondary Eng. The engineer scheduling function in Call Maintenance awards points to this engineer based on the Primary Eng Points field in Engineer Schedule Control.

Engineer Group. Enter an optional code to group engineers. Set up code values in Generalized Codes Maintenance for field fsgroup. You might, for example, group engineers who do only telephone support separately from those who work in the field.

Service Area. Enter the code you set up with Area Maintenance to identify the geographical area of this end user. Usually the area relates to a service center. For example, a service center may service North America, Canada, or just the province of Ontario. You can define call queues and assign engineers for each service area.

The engineer scheduling sequence in Call Maintenance awards points to engineers with an area matching the end user initiating the call.

Tip
Specifying unique escalations lets you give extra priority or special handling to certain callers.

Escalation Number. Enter an optional code indicating the escalation sequence for calls initiated by this end user. Any sequence here overrides escalation defaults set in Call Default Maintenance, Service/Support User Preferences, or the standard escalation in Escalation Control.

Travel Distance and UM. Enter the distance, in the travel unit of measure, from the service center to this end user. The unit of measure is M (miles) or K (kilometers) and defaults from Call Management Control. Values specified here display in the Travel and Estimated Time frame of Call Maintenance.

Travel Time. This value designates the number of hours required to travel between an end-user installation and the service office. It also sets the default for the Travel Time field in the Travel and Estimated Time frame of Call Maintenance, and can help calculate the estimated time for the call. Note that the system does not include travel time when calculating engineer load; it is only for reference.

Processing Defaults

The next frame of End User Address Maintenance defines defaults for an end user that are used by other functions.

Fig. 2.6
Processing Defaults Frame

Create ISB. The value of Create ISB in End User Control determines the default for a new end user. This field indicates whether to create installed base records for this end user. The setting in this field and the value in the Installed Base field of Service Item Maintenance must both be Yes for the system to add an item to the installed base.

These two fields affect the default value for the Update Installed Base field in the Installed Base Detail frame of Sales Order Maintenance, Pending Invoice Maintenance, and RMA Maintenance. They also affect the Update ISB field in Call Maintenance, Call Quote Maintenance, and Call Activity Recording.

PO Required. Yes in this field indicates that you cannot record service activity for this user without a purchase order. This feature is for organizations that do not use service contracts, but purchase service on a case-by-case basis. The value for the end user defaults from the associated customer. This field affects the following:

- RMAs and Service Contracts. If a PO is required, you must enter it before the line items can be updated.
- Contract Quotes. If no purchase order exists, a warning states that a PO is required. You cannot release the quote to a contract without a PO number.
- Call Quote Maintenance and Call Maintenance. You can create calls and quotes without a PO, but a warning displays.
- Call Activity Recording. If the end user requires a PO, you cannot get past the header without entering it.
- Call Quote Release to Recording. If an end user requires a PO and none is specified, the quote cannot be released.

Auto Renew Contracts. The value in this field determines the default displayed in Contract Maintenance (11.5.13.1) for the Auto Renew field when you add this end user to a contract. Renewal Process/ Report (11.5.13.10) examines this field to determine which contract lines should be renewed.

Invoice Format

The Invoice Format frame of End User Address Maintenance defines the level of detail displayed on printed invoices for this end user. You define the level of detail initially when each invoice sort is set up. The detail level you specify for an end user overrides the level associated with the invoice sort.

Fig. 2.7
Invoice Format Frame

Ln. Line number created by the system.

Invoice Sort. Enter the name of an invoice sort. You can specify a level of detail for this invoice sort for this end user that is different from the default for this invoice sort in general.

Det. The Det (detail) column determines whether detailed or summarized invoice information is printed on invoices for this end user. The value here is the default for the Invoice Detail column in Call Invoice Recording when calls for this end user are reviewed.

Contacts Frame

You can list several contact names for each end-user address, and designate the primary contact (Name Type is P). Each contact name has its own title, telephone, and fax numbers.

Tip
To determine which end user a caller is associated with, search by contacts in the End User Selection frame of Call Maintenance.

At least one contact record must exist for the end-user look-up to work correctly in Call Maintenance. The system creates a record before displaying this frame, using the Attention field of the End User Address frame. If the Attention field is blank, the end-user sort name is used, then the end-user name. If all of these are blank, the system creates a contact record with a blank name.

Type over a contact name or, in the case of a blank record, add a name, to modify it. You are prompted to specify whether you want to change the name associated with this contact or create a new one.

The first primary contact and associated phone number display by default in the Caller and Phone fields when you create a call for this end user. This information prints on the call for the engineer.

Fig. 2.8
Contacts Frame

Name. The name of an individual at this end-user location. The system adds the name in the Attention field as a primary contact. If the Attention field is blank, the end-user sort name is used, then the end-user name.

Name Type. This field can be blank, indicating a normal contact. Enter a P to indicate a primary contact. Normally, only one contact is designated as primary. This is the contact name you usually want to display when you receive a call from this end user.

Title. A 20-character field for the contact's title or position. This field is for reference only.

Contact Type. An optional code for grouping contacts. Define codes in Generalized Codes Maintenance for field eud_type.

Phone. Enter the phone number where this contact can be reached. The phone number associated with the primary contact displays in the Phone field of Call Maintenance when a call for this end user is taken.

Fax Number. Enter the fax number where this contact can be reached.

Last Update. The last date when changes were made to this end-user contact information. This field is for reference only. When the contact is first added, this date is the system date. Any time you change the contact information, the system updates this field.

Creating End Users Indirectly

You can also create end users during other service functions or when updating the installed base. You may know little about the end user, basically the name and address. Use End User Address Maintenance later to specify details about end users the system creates.

Creating End Users During Invoice Post

See “Creating ISB Records During Invoice Post” on page 58.

If Ship to Installed Base is Yes in Service Management Control, Invoice Post can create installed base records for items shipped. If you have not already defined the ship-to on the sales order as an end user, Invoice Post also creates an end-user record.

Update Installed Base defaults to Yes if both:

- Installed Base for the item in Service Item Maintenance is Yes.
- Create ISB for the end user is Yes.

If a ship-to address is not an end user, the item is an installed base item, and Create ISB in End User Control is Yes, Update Installed Base defaults to Yes in Sales Order Maintenance.

If SO Edit ISB Defaults is Yes in Sales Order Control, a pop-up window lets you update this value. Otherwise, it takes effect when Invoice Post adds the item to the installed base and creates the end-user record.

Note Invoice post adds records to the system as customer ship-to addresses. You cannot change the address information with End User Address Maintenance. You can add end-user details, but you change the address itself in Customer Ship-To Maintenance (2.1.13).

Creating End Users from Other Service Functions

When a business sells only to retailers or distributors, direct knowledge about end users may be unavailable. To identify end users, the business might use product registration cards, phone-in registration, or a contest registration.

Even with these mechanisms, such a business often finds out about end users when they call or attempt to start a service contract or return an item. Service personnel making the first contact are likely to be using one of the following:

- Call Maintenance
- Call Quote Maintenance
- Contract Maintenance and Contract Quote Maintenance
- RMA (Return Material Authorization) Maintenance

Since service personnel can add end users in these functions, the process is streamlined.

Note Whether you can create end users in Contract Maintenance and Contract Quote Maintenance depends on the setting of Bill End Users. When you are billing end users, they must be set up previously in Customer Maintenance.

See “Billing Customers or End Users” on page 314.

Figure 2.9 illustrates the frame that displays in Call Maintenance when you leave End User blank and indicate that you want to add one.

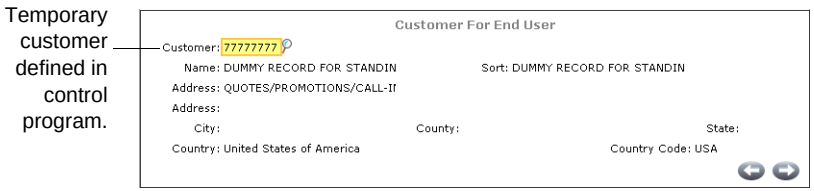
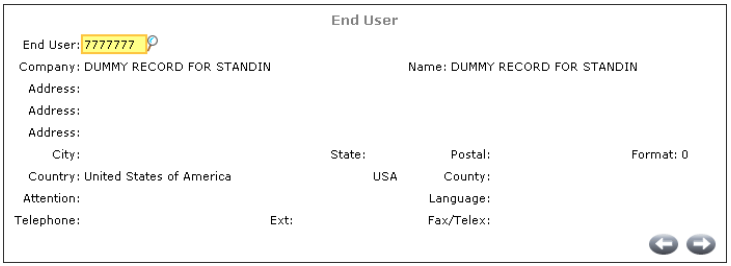


Fig. 2.9 Customer for End-User Frame

By default, the first frame displays information about the temporary customer, as defined in Call Management Control. This lets you define an end user, and you can define an end user without a valid customer. This is essential if you service items sold through distributors or retailers and end users contact your company for service.

Figure 2.10 illustrates the frame for specifying end-user information.

Fig. 2.10
End-User Frame



You can specify minimal information for the new end user.

Deleting End User Records

You can delete obsolete end user records with End User Address Maintenance. The system checks for service contracts, service quotes, calls, service requests, or RMAs associated with the end user. If any of these exist, an error displays. If call history exists, a warning displays.

When you delete an end-user record, the system removes all installed base records associated with the end user, as well as end-user contact information, and any comments associated with the end user.

Note If end-user records are associated with a customer record, you cannot delete the customer in Customer Maintenance until you delete the end users using End User Address Maintenance.`

Implementing the Installed Base

If you decide to track the installed base, you must make a number of other business decisions such as the following:

- Do you want items added to the installed base when they are sold, or will you manually add them, perhaps when registration cards are returned?
- Will items you do not manufacture be added to the installed base?
- Will you support only those items recorded in the installed base? Do you normally support only a special subset of items marked as system level?

- Do you have different installed base requirements for items that you cover on service contracts?
- Of the items you manufacture, which ones do you want included in the installed base?
- Do you want to track items in the installed base for all end users, or only for certain end users with special requirements?
- Do you need to track parent items only or also components in the installed base?
- Will you track replacement parts when an item is repaired and add them to the installed base?
- Do you want to keep an audit trail of manual updates to the installed base?

Your decisions regarding the installed base are implemented in through control program settings. Figure 2.11 illustrates settings in Service Management Control that affect the installed base.

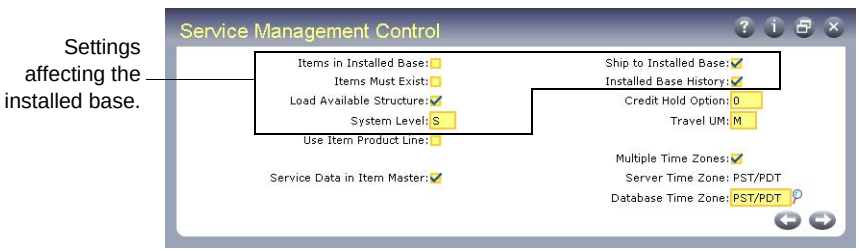


Fig. 2.11 Service Management Control (11.24)

Restricting Support to the Installed Base

If you want to use the installed base as a validation database, set Items in Installed Base to Yes. This prevents the creation of call quotes and calls referencing an item not in the installed base. When set to No, only a warning displays in these functions. When you take calls for items not in the installed base, the installed base record is created before you record activity or when you close the call.

If you do not know your end users until they call the support department, you should set this field to No.

See “Items in Installed Base” on page 770.

A similar field also exists in Contract Control (11.5.24), which determines how items added to contract and contract quotes are validated. The contract value defaults from Service Management Control. The two fields support a flexible approach to managing the installed base. For example, you can set the field in Service Management Control to No so that you can take calls for any item. Then set the field in Contract Control to Yes so you provide coverage for items in the installed base only.

You can define any combination of Yes and No values for the two Items in Installed Base fields. However, setting Items in Installed Base to Yes at the system level and No at the contract level can create problems if you do not ensure that covered items are added to the installed base later. Otherwise, you will not be able to create a call for an end user with valid contract coverage.

Restricting the Installed Base to Inventory Items

When implementing SSM, you must decide which items to include in the installed base. When Items Must Exist is Yes in Service Management Control, the installed base includes only inventory items.

See “Service Item Maintenance” on page 43.

For installed base records to be created when you ship inventory items on a sales order, you must also use Service Item Maintenance (11.3.7) to set Installed Base to Yes.

Effect of Setting Items Must Exist to No

When Items Must Exist is No, service personnel can take calls for items not in your item master. This means you service items that you do not manufacture and sell. Consider carefully servicing third-party items and the consequences of having items that you do not manufacture or stock in your installed base.

Items not in the item master are *memo items*. ISB records for memo items are exactly like inventory items. You can add records in Installed Base Item Maintenance (11.3.1) or indirectly in programs such as Call Activity Recording. Invoice Post does not create ISB records for memo items through sales orders, since they are not items you manufacture and sell.

Example A customer purchases a disk drive from another vendor and adds it to the system they bought from Ace Computers. The customer wants Ace Computers to service the disk drive. Ace Computers wants this service business, so they set Items Must Exist to No and add this component to the installed base.

Effect of Setting Items Must Exist to Yes

If you usually service only items you produce, you can restrict the installed base to items defined in the item master by setting Items Must Exist to Yes. Then you cannot take calls or provide other service such as RMAs or contract coverage for an item unless it is set up in the item master. This, in turn, prevents items that are not in your item master from being entered into the installed base.

Note You can still leave the Item Number field in Call Maintenance blank when Items Must Exist is Yes. This lets you take calls such as telemarketing inquiries when an item number is not applicable. You can also take a call when the item number is not initially known but will be recorded later.

Tracking Manual ISB Updates

When updates are made to the installed base automatically during invoice post, an audit trail is available through standard audit mechanisms such as invoice and call history records.

The Installed Base History field enables you to maintain a separate audit trail of manual updates to the installed base. This can provide an important element in tracking additions, changes, and deletions performed through Installed Item Maintenance, Installed Item Move, and Installed Configuration Maintenance.

When this field is set to Yes, the system creates history records whenever an ISB record is manually added or deleted, or when the serial number is changed. ISB history records contain the following information:

- The address code of the end user who owns the item.
- The effective date of the event. For installed base moves, this may be different than the system date.
- The date the record was created.

- The ID of the user performing the update.
- The number, serial number, and model of the item.
- A transaction number and transaction type (either ISB-ADD, ISB-MOVE, ISB-DLET, or ISB-SERL).

When a serial number change occurs, both the old and new numbers are recorded. When an item is moved, the old and new end-user codes are recorded.

Installed base history records can be displayed with ISB History Browse (11.3.22.2) or ISB History Report (11.3.22.3). They can be deleted and archived with ISB History Delete/Archive (11.3.22.23).

Including Product Structures in the Installed Base

You must decide whether to include both components and parent items in the installed base. There are several advantages to having the product configuration in the installed base:

- Customer service can determine exactly what is in the configuration.
- If you move the item to a different end user, the entire configuration moves.
- If you replace one or more components during a service activity, you can update just those components in the installed base.

Tracking components is common in two situations:

- If the items you sell are subject to recall or contain components whose failure presents potential hazards, you may need to track individual components. Companies subject to government regulations often must keep detailed records about items and their components.
- If you sell configured products, you may want to keep track of which options an end user has. Some of the options may also be sold separately, and may have warranty terms that differ from the parent item. A personal computer is a good example of a configured product that can contain items also sold as products. For example, monitors and disk drives may be sold separately and tracked separately in the installed base.

The system can add product configurations to the installed base automatically if Load Available Structure is Yes in Service Management Control. This update occurs during Invoice Post or from Call Activity Recording.

Adding as-built configurations to the installed base automatically is possible only for items you manufacture or configure. If you track third-party items, use Installed Configuration Maintenance (11.3.5) to add configuration information for them.

Note When you add items to the installed base while you are recording service in Call Activity Recording, the system always adds them as first-level components of the call line item with which they are associated.

If SO Edit ISB is Yes in Sales Order Control, you can also indicate that an item sold is a component of a parent by specifying the parent item's serial number and item number. The system then adds it as part of that item's installed base configuration. The same is true in RMA Maintenance if Edit Installed Base is Yes in RMA/RTS Control.

Load Available Structure

The Load Available Structure field determines whether Invoice Post adds product structures to the installed base. Setting this field to Yes only has an effect if certain other conditions are also true:

- The item must be one you manufacture or configure.
- Ship to Installed Base must be Yes.
- Installed Base must be Yes and the parent and each component to be added to the installed base must be service items in Service Item Maintenance.
- The item must be added to the installed base with a quantity of 1. The shipment quantity for configured items must be 1 and the work order quantity for serialized or lot controlled items must be 1 for the system to uniquely identify the as-built structure. Since lots seldom have a quantity of 1, Load Available Structure usually does not affect lot-controlled items.

- The parent item must be serial-number controlled, unless it is a configured product. A configured product on a final assembly work order can be identified without a serial number if it is shipped with a quantity of one.

If the product structure contains subassemblies, the parent item of the subassembly must be serial-number controlled for the system to attempt to find and add its components to the installed base.

If these conditions are met, the system attempts to add components of the parent item to the installed base as derived from the sales order BOM or the work orders used to build it and its components. This information is derived from the transaction history.

If Load Available Structure is No and Ship to Installed Base is Yes, only the parent generates ISB records. The components generate no details.

Transfer of Item Information from Sales and Work Orders

The installed base inherits item information based on the way the item was made or sold. This *as-built configuration* information comes from records generated in the Sales Orders/Invoices and Work Orders modules.

Tip
Use Sales Order Release to Work Order (8.13) to create discrete work orders.

You can use either a final assembly process or a discrete work order to create configured items. Either process creates the transactions necessary to update the installed base with the actual components.

Components can only be added to the installed base when transaction history uniquely identifies the parent and components:

- A single work order for multiple parent items does not provide enough information in the transaction history to determine which serialized components belong to which parent.
- Transaction history is ambiguous if the work order for a component item is for a quantity greater than that required by the parent. The system loads components until the history becomes ambiguous.

ISB Unit Quantity

The ISB Unit Quantity field of Service Item Maintenance affects how non-serial-controlled items are added to the installed base on an item-by-item basis. This field does not affect serialized items, which are always added with a quantity of one.

- When the field is No and you ship a quantity greater than one on a sales order line, the system creates only one ISB record for the shipment quantity. If you ship three items, the system creates one ISB record for a quantity of three.
- When the field is Yes, the system creates unique ISB reference numbers for each item shipped and each record has a quantity of one. The shipment line with a quantity of three creates three records for the same item number (and lot) but with three reference numbers.

Recording Call Activity for Multiple Items

ISB Unit Quantity affects how items in the installed base can be repaired in Call Activity Recording. If the quantity of the item to be repaired does not match the ISB record, components issued and returned in CAR do not update the installed base.

If ISB Unit Quantity is Yes and you always create a call line for each item to be repaired, you will not encounter quantity mismatches in CAR. Otherwise, change the quantity on the line item to match the installed base record if you want components to update the installed base.

Using the System Level Setting

One other setting helps manage information in the installed base. Each service item can have an item type code in Service Item Maintenance. Set up the codes in Generalized Codes Maintenance for field pt_sys_type. In Service Management Control, the System Level field designates a code indicating a system-level item.

Normally, system level refers to the parent or top-level item in a configured product structure. However, you can use this attribute in any way that is meaningful to your organization.

Select System Level Only in the Installed Base Report (11.3.3) to view only system-level installed base items.

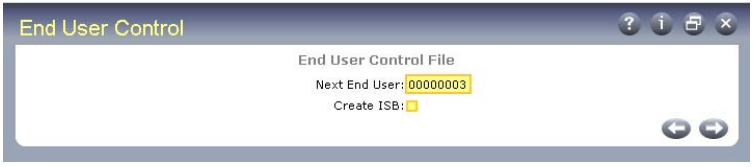
Call Management can handle system-level items differently. When System Level on Calls in Call Management Control is Yes, using Next/Previous in the Item Number field in Call Management displays only items with a system type that matches the value in System Level in the control program.

Use this feature if your service department takes calls only for certain kinds of items, or to ensure that calls always refer to top-level parent items, not components.

End User Control

The Create ISB field in End User Control, illustrated in Figure 2.12, also affects installed base updates.

Fig. 2.12
End User Control (11.9.24)



Create ISB sets the default value for the Create ISB field for new end users. Create ISB for an end user determines, in turn, whether the system normally adds items associated with the end user to the installed base.

This field gives you more control over how items are added to the installed base. If you usually add items to the installed base regardless of the end user, set Create ISB to Yes and this value will flow to the functions that create ISB records. To more tightly control ISB updates so that records are created only for a predefined set of end users, set this field to No and change the field in End User Address Maintenance.

See “Creating End Users During Invoice Post” on page 32 for additional details.

This setting is especially important if you are shipping sales order line items to the installed base. The system looks at Create ISB in the control program whenever a ship-to address is not defined as an end user. If you want to add items by default to the installed base in this situation, make sure Create ISB is Yes in the control program.

Service Item Maintenance

If you typically provide service for a well defined set of items, you can define service attributes for them with Service Item Maintenance (11.3.7). First define the items in Item Master Maintenance, even if Items Must Exist is No in Service Management Control.

If you set Service Data in Item Master to Yes in Service Management Control, these same frames display in Item Master Maintenance (1.4.1).

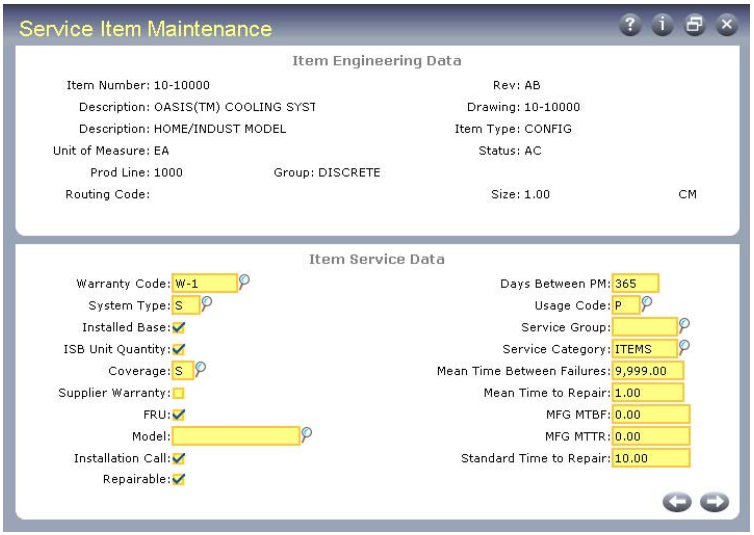


Fig. 2.13 Service Item Maintenance (11.3.7)

Service Item Maintenance influences key service activities including managing the installed base, recording service activity in Call Activity Recording, determining coverage for items in the installed base, the creation of installation calls, and definition of standard service BOMs and routings.

For example, to add inventory items automatically to the installed base during sales order shipment, set them up with the Installed Base field in Service Item Maintenance set to Yes. This indicates to the system that the service organization supports this item and prevents cluttering the installed base with items the organization does not service.

If Ship to Installed Base is Yes (11.24), many service attributes are used when Invoice Post creates an installed base record. If SO Edit ISB Defaults is Yes in Sales Order Control (7.1.24), you can change the

default values when you generate the sales order. Otherwise, the system creates the record in the background using default values. To make changes later, use Installed Base Item Maintenance (11.3.1).

Item Engineering Data Frame

After you enter or select a valid part number, the system fills in the fields in this frame from the item record, for display only.

Item Service Data Frame

In this frame, specify information the system uses during service of this item.

Warranty Code. Enter a warranty code set up with Warranty Type Maintenance. This code supplies the default for new installed base records for this item.

You can modify the default in the Installed Base Detail pop-up in RMA Maintenance, Sales Order Maintenance, and Pending Invoice Maintenance if control program settings permit editing of the installed base record. If not, the system applies the defaults. For ISB records created during Invoice Post, the warranty start date defaults from the ship date. For installation calls, the warranty start date is the call closure date.

Tip
System level normally indicates the top-level item in an installed configuration, but it can have any application suitable for your system.

System Type. Validated against generalized codes for pt_sys_type. Three values are supplied: software (SW), System (S), or Other (O). You can set up additional codes in Generalized Codes Maintenance.

The System Level field in Service Management Control determines which system type code is considered system level. You can choose to see only system-level items on the Installed Base Report (11.3.3). If System Level on Calls is also Yes in Call Management Control, Call Management is affected. During next/previous processing in the Item field, only items with this system type display.

Installed Base. Yes indicates you want this item in the installed base. The system considers this field in conjunction with the Create ISB field for an end user for new sales orders or calls, or when a repair uses the item. If both are Yes, the system assumes the item should be in the installed base.

Depending on the function, the system either creates an installed base record in the background, or supplies a default you can change.

Tip
The system looks at the value of Create ISB in End User Control for a sales order ship-to address not yet defined as an end user.

ISB Unit Quantity. The system reviews this field when it adds items to the installed base—when you post sales orders or RMAs, close calls, or record activity in Call Activity Recording. The field is effective only when Installed Base is Yes and the item is not serial-number controlled. Records for serialized items always have a quantity of 1.

No: The system creates one installed base record for multiple items on a line using the line-item quantity.

Yes: Each installed base record has a quantity of one. If a given sales order or RMA shipped more than one item or a call line contains more than one item, the system creates multiple installed base records, each with the same item number (and lot), but with a different installed base reference number.

Coverage (S/C/N). Indicate whether the same warranty covers both the parent item and components of this item.

- If S (subassemblies covered), the same warranty covers the finished product and its lower-level subassemblies.
- If C (covered), this warranty covers only this item. You can associate different warranty information with separate installed items for each of the components.
- If N (not covered), there is no warranty coverage.

Supplier Warranty. A reference-only field indicating whether this item normally comes with a supplier warranty. Yes indicates that if a problem with this item occurs during the supplier warranty period, the original supplier will repair the item.

FRU. Indicate if this item is a field-replaceable unit. Yes means that if this unit is defective, you can replace wit. This field is for reference only and appears on reports and inquiries to help the engineer handle a service call.

Model. Enter the model number associated with this item. Many organizations service products by model. In Call Default Maintenance (11.1.21.10), you can create separate call defaults for each model you service. This is useful if calls associated with various product models follow different paths.

Installation Call. Specify Yes if this item must be installed by a service engineer. This field is used with the Auto Install Calls field in Call Management Control (11.1.24). If both are Yes, the system creates an installation call during Invoice Post of sales orders and RMAs.

The system uses the Install Work Code in Call Management Control and the installation BOM and routing in the Service Structure Data frame for the call.

Repairable. Indicate whether this item is repairable. When Yes, this value has the following effects:

- You can attach a repair BOM and routing to this item in the Service Structure Data frame without a warning.
- When a repairable item is issued in Call Activity Recording, the system assumes one will be returned and defaults a value into the quantity returned field of the Item Usage frame.
- The value of repairable affects the default return locations suggested by the system during return processing in CAR.

Days Between PM. Specify the length of the preventive maintenance (PM) cycle for this item in calendar days. A nonzero value has the following effects:

- The system adds this value to the install date to determine the initial Next PM Date value in Installed Base Item Maintenance (11.3.1).
- When this item is added to a contract, the PM Item field defaults to Yes.
- You can attach a PM BOM and routing to this item in the Service Structure Data frame without a warning.
- The system uses this value when you close a PM call and Create PM Calls is Yes in Contract Control (11.5.24) to calculate the next PM date. The Days Between PM is added to the PM call closure date.

Usage Code. Specify an optional code you set up in Generalized Codes Maintenance for field pt_svc_type. This field is for reference only and displays on some reports and inquiries.

Service Group. Specify an optional code you set up in Generalized Codes Maintenance for field pt_svc_group to group types of service costs. You can use Service Group in setting up call defaults, default sites, price lists, and charge and revenue product lines.

Service Category. Enter a service category defined with Service Category Maintenance (11.21.9) for items, exchanged items, or consumable items.

Service categories support detailed tracking of invoice costs and service coverage levels. If you do not associate a service category with an item, Call Activity Recording uses the default item service category defined in Call Management Control.

MTBF, MTTR, MFG MTBF, MFG MTTR, STTR. These fields record optional statistics. Possibilities include the mean time to failure and mean time to repair this item; the standard manufacturing mean time to failure and to repair this kind of item; and the standard time to repair this item. The standard time may not always be the same as the mean time to repair, since the mean is an average of actual times, and the standard is a goal.

Service Structure Data Frame

Service structures and routings are important for streamlining data entry in call functions. They enable the system to load the items normally consumed in the service of an item and the sequence of operations performed into the detail of call quotes and Call Activity Recording.

See Chapter 20, “Service Structures and Routings,” on page 659 for details on how to set up routings.

You can associate three BOMs and routings with an item that the system uses under different circumstances:

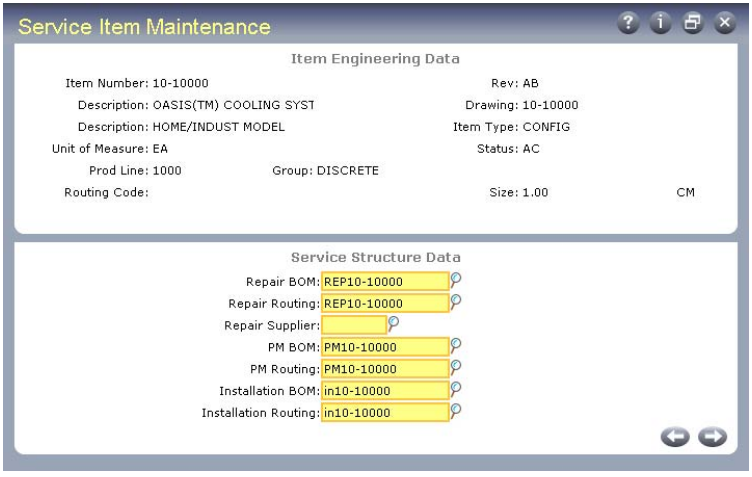
- The system uses the repair BOM and routing for calls you created with work codes other than PM or Install with Call Maintenance, Call Quote Maintenance, and the Call Generator. The system also uses the repair routing on work orders created by RMA Release to Work Order. A repair BOM and routing normally apply only if Repairable is Yes; otherwise, a warning displays.

- The system uses the PM BOM and routing for calls it creates during PM scheduling in Contract Maintenance or with the PM work code in Call Maintenance, Call Quote Maintenance, or Call Generator. A PM BOM and routing normally apply only if the Days Between PM field is not zero; otherwise, a warning displays.
- The system uses the installation BOM and routing when it creates a call with the Install work code in Call Maintenance, Call Quote Maintenance, or Call Generator or when Invoice Post creates an installation call for a newly sold item. An installation BOM and routing normally apply only if Installation Call is Yes; otherwise, a warning displays.

See Chapter 20, “Service Structures and Routings,” on page 659.

The printed call can include the component structure of the BOM and the routing steps in the form of the list of parts and procedures relating to the call item. The system can load these items and operations into the detail frames of Call Quote Maintenance or Call Activity Recording. Automatic loading streamlines the recording of operations and items consumed.

Fig. 2.14
Service Structure Data Frame



Repair BOM. Enter a service structure defined in Service Structure Maintenance (11.19.5). This BOM code defines the items typically used to repair this item. The system uses the repair BOM when it creates a call with any work code other than Install or PM.

A printed call can include the items on the BOM in the form of a list of items needed during the service activity. You can also load the items on the BOM into the Item Usage frame in Call Activity Recording and Call Quote Maintenance. If Repairable is not Yes for the current item, a warning displays when you specify a repair BOM.

Repair Routing. Enter a service routing defined in Service Routing Maintenance (11.19.17). This code defines the normal sequence the engineer follows in repairing this item. It is the default when the system creates a call with any work code other than Install or PM.

A printed call can include the operations on the routing in the form of a list of procedures to be executed during the service activity. You can also load the operations on the routing into the Labor/Expense Usage frame in Call Activity Recording and Call Quote Maintenance. The system also uses the repair routing when RMA Release to Work Order creates a work order. If Repairable is not Yes for the current item, a warning displays when you specify a repair routing.

Repair Supplier. Identifies the supplier of repair parts. This field is for reference only.

PM BOM. Enter a service structure defined in Service Structure Maintenance (11.19.5). This BOM code defines the items an engineer typically uses during preventive maintenance of this item. The system uses the PM BOM when it creates a call with the PM work code.

A printed call can include the items on the BOM in the form of a list of items needed during the service activity. You can also load the items on the BOM into the Item Usage frame in Call Activity Recording and Call Quote Maintenance. If Days between PM is zero for the current item, a warning displays when you specify a PM BOM.

PM Routing. Enter a service routing defined in Service Routing Maintenance (11.19.17). This code defines the normal sequence of steps an engineer takes during a PM visit. The system uses it when it creates a call with the PM work code.

A printed call can include the operations on the routing in the form of a list of procedures to be executed during the service activity. You can also load the operations on the routing into the Labor/Expense Usage

frame in Call Activity Recording and Call Quote Maintenance. If Days between PM is zero for the current item, a warning displays when you specify a PM routing.

Installation BOM. Enter a service structure defined in Service Structure Maintenance (11.19.5). This BOM code defines the items an engineer typically uses during installation. The system uses the installation BOM when it creates a call with the Install work code.

A printed call can include the items on the BOM in the form of a list of items needed during the service activity. You can also load the items on the BOM into the Item Usage frame in Call Activity Recording and Call Quote Maintenance. If Install Call is No for the current item, a warning displays when you specify an installation BOM.

Installation Routing. Enter a service routing defined in Service Routing Maintenance (11.19.17). This code defines the normal sequence of operations taken by an engineer to install the item. The system uses it when it creates a call with the Install work code.

A printed call can include the operations on the routing in the form of a list of procedures to be executed during the service activity. You can also load the operations on the routing into the Labor/Expense Usage frame in Call Activity Recording and Call Quote Maintenance. If Install Call is No for the current item, a warning displays when you specify an Installation routing.

Service Item by Site Maintenance

If you perform service activities at more than one site, the procedures you follow and the items you use may vary. For example, work centers names may be different or alternate parts used

Use Service Item by Site Maintenance (11.3.9) to tailor service BOMs and routings based on the site of the service activity. Where BOMs and routings apply, the system checks first for an item/site record. If this record does not exist, it uses the BOMs and routings for the item in Service Item Maintenance.

Before setting up service-structure data for items at different sites, consider how service functions determine a default site. For call-related functions, the system searches in the following order to determine a default site for an item being serviced.

1. The site associated with the assigned engineer in Engineer Maintenance
2. If the engineer does not have a site, the site associated with the engineer's area
3. If these values are blank, a default spares site in Default Site Maintenance using the product line and service group of the item, and work code, item number, and area of the call
4. The site defined in the item master
5. The site associated with the end user's customer in Customer Maintenance

See "Search Algorithm" on page 95 for details on how default sites are found.

In RMA Release to Work Order, the system uses the RMA receipt site.

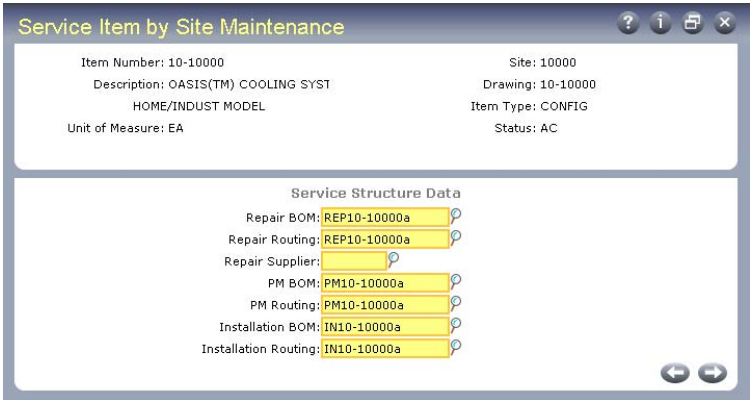


Fig. 2.15 Service Item by Site Maintenance (11.3.9)

Item Number. Enter an item code from Item Master Maintenance. The BOMs and routings you specify here apply to this item when you service it at the associated site.

Site. Enter the code that identifies a site for defining unique BOMs and routings for the current item. Since items and procedures may vary by site, the system uses these BOMs and routings by default in call functions associated with this site.

After you enter or select a valid part number and site, the system fills in the other fields in this frame from the item record, for display only.

See “Service Structure Data Frame” on page 47.

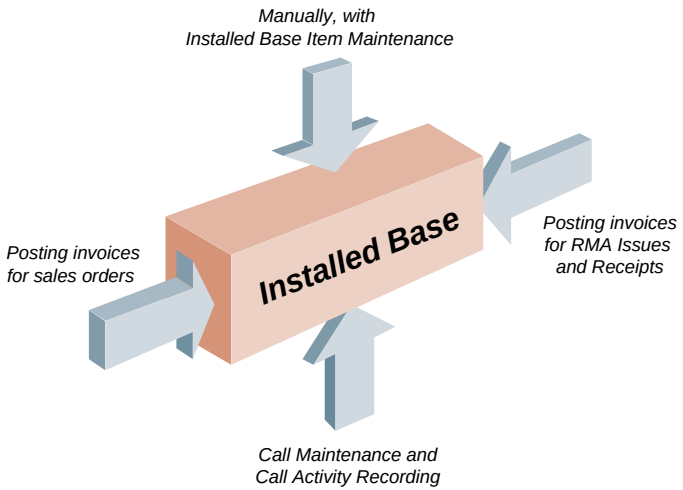
The fields for BOMs and routings are exactly the same as those in Service Item Maintenance.

Creating Installed Base Records

The installed base consists of records tying items with the end users who use them. Figure 2.16 illustrates ways you can create these records:

- Manually, using Installed Base Item Maintenance (11.3.1) and Installed Configuration Maintenance (11.3.5).
- Automatically, when you post invoices for sales order shipments and RMA issues and receipts.
- Automatically, from call tracking functions. When you close a call in Call Maintenance, you can update the installed base. Otherwise, Call Activity Recording can update the installed base for the item on the call and for items issued to repair it.

Fig. 2.16 Updating the Installed Base



Installed Base Item Maintenance

Use Installed Base Item Maintenance (11.3.1) to enter new items directly into the installed base. This function is particularly helpful for companies that manually add items and configurations to the installed base.

Example A company has sold products for several years before implementing the Service/Support Management module. They have perhaps several thousand units in the field without corresponding installed base records. They have a choice: either backfill the installed base as end users call with questions and problems, or enter installed base records from existing sales order or service contract records.

Other typical uses for Installed Base Item Maintenance include:

- Extending the warranty expiration date
- Changing the revision level of the item
- Entering and updating preventive maintenance (PM) dates and setting the interval between last/next PM dates
- Deleting obsolete records

If an open call, a call that has been moved to history, or an unexpired service quote or contract references an installed base record, you cannot delete it.

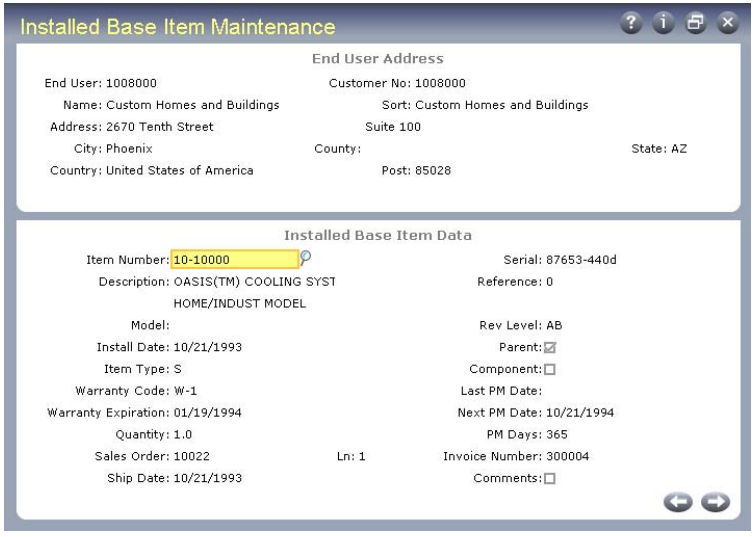


Fig. 2.17
Installed Base Item Maintenance (11.3.1)

End User Address Frame

After you enter or select a valid end user, the system fills in the fields in this frame from the end user record, for display only.

Installed Base Item Data Frame

In this frame, you specify or update information related to the installed base item. The Sales Order, Line, Ship Date, and Invoice Number fields are display only. The system updates them when the item is added to the installed base during Invoice Post or from Call Activity Recording.

The Parent and Component fields are also set by the system when components are added beneath a parent during Invoice Post, from Call Activity Recording, or from Installed Configuration Maintenance.

See Chapter 4, “Multiple Time Zones,” for details.

If MTZ is active, the end user’s time zone can affect dates.

Item Number. Identify an item installed at this end-user location. This may be a finished product, such as a computer, or a component, such as a disk drive or memory board. Validation depends on Items Must Exist in Service Management Control. If Yes, the item must be in Item Master Maintenance. If No, you can enter any item number. Use next/previous processing to see the items installed at an end-user site.

Serial. Specify the lot or serial number uniquely identifying the installed item. If the item is defined in the item master to require lot/serial control, this field is required. Invoice post adds serial numbers to the installed base. To change the serial number of an installed base item, use the New Serial field on the pop-up window that displays after you press Go.

Description. Defaults from the first line of the description in Item Master Maintenance.

Tip
If you add installed items manually, enter a question mark (?) in the Ref field to see the next available reference number.

Reference. You can only update this field for items not serial number controlled. For serialized items, Reference is always zero, since the serial number must be unique. If an item is not serial controlled, the ISB reference number uniquely identifies it in the installed base. The system checks for the last reference number for this item and serial number, increments this by one, and displays this value.

The ISB reference number is not an inventory reference number. Although each provides a unique pointer to a particular item, one identifies items owned by your end users; the other identifies items in your inventory locations.

Model. Enter the model number associated with this item. For new items, this defaults from Service Item Maintenance. For existing items, the system reads the value from the installed base. You can base call defaults on the model.

Tip
To ensure consistency, set up values in Generalized Codes Maintenance for field pt_model.

Install Date. For a new item, Install Date defaults from the system date, but you can change it. When Invoice Post creates an installed base record, the install date defaults from the sales order shipping date. If the item has Install Call set to Yes, the system sets the install date to the ship date plus the installation days ahead in Call Management Control. When you close the installation call, however, the system updates Install Date to reflect the call closure date and recalculates the warranty end date.

The system applies these rules for defaulting an install date only if you do not specify an install date in the pop-up window of Sales Order Maintenance or in Installed Base Item Maintenance. The system never overwrites an install date you specify.

Item Type. Defaults from the value for the same field in Service Item Maintenance and is validated against generalized codes for pt_sys_type. Three values are supplied: SW (software), S (system), and O (other). You can add codes in Generalized Codes Maintenance. Specify one code as system level in the System Level field in Service Management Control. You can choose to see only system-level items on the Installed Base Report.

Tip
System level normally indicates the top-level item in an installed configuration, but you can apply it to suit your system.

If System Level on Calls is also Yes in Call Management Control, during next/previous processing in the Item field of Call Maintenance the system displays only items marked with this system type.

Warranty Code. The warranty code defaults from service item information.

Warranty Expiration. The system calculates the expiration date by adding the warranty duration to the install date. You can manually change this, but if you specify a warranty, you must also specify an expiration date.

Quantity. Sales order post updates this field by the quantity on the order line, unless the item is serialized, in which case item quantity is always one.

Sales Order, Ln, Ship Date, Invoice Number. These fields are display only. The system updates them when the item is added to the installed base during Invoice Post or from Call Activity Recording. When Call Activity Recording adds an item to the installed base, the system updates Sales Order and Line to reflect the call ID and line number from which the update originated.

Rev Level. An optional code identifying the engineering revision of this item. If this installed base item is in Item Master Maintenance (1.4.1), the value defaults from there.

Tip
Components and parents can also be created manually using Installed Configuration Maintenance.

Parent and Component. These fields are display only, and set when Invoice Post or Call Activity Recording adds components beneath an item in the installed base.

Last PM Date. The system updates this field when you close a call with the PM work code for this item. The Last PM Date is the call close date.

Next PM Date. This field is display only. The system adds the Days Between PM value in Service Item Maintenance to Last PM Date or, if blank, to Install Date.

PM Days. Defaults from the value in Days Between PM in Service Item Maintenance and indicates the PM cycle for this item in calendar days. The system adds this value to the install date initially to determine the Next PM Date field value in Installed Base Item Maintenance. When you close subsequent PM calls, the system adds PM Days to Last PM Date to determine the Next PM Date value.

Comments. Defaults to Yes if comments exist; otherwise defaults to No. If Yes, the standard transaction comments frame displays when you press Go, so you can enter or review comments associated with this installed base item. Comments display on the Installed Base Report.

Installed Base Detail

You can add additional details about the installed base item or change its serial number in a final pop-up window.

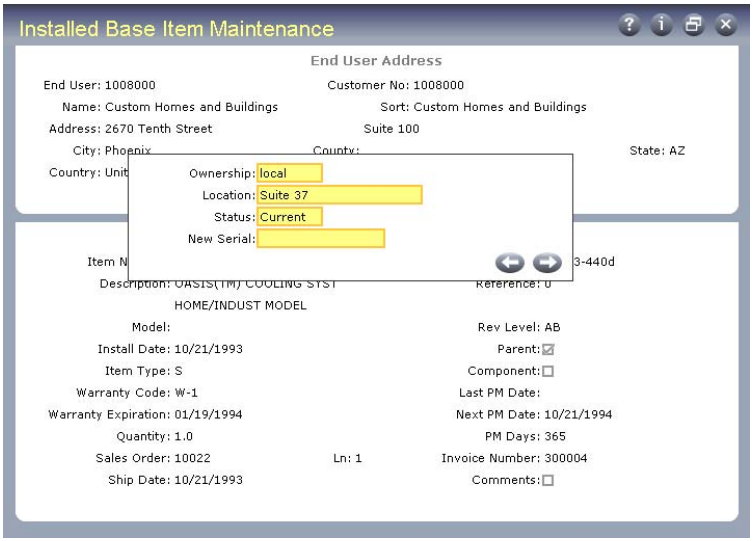


Fig. 2.18
Installed Base Pop-Up

Ownership. A reference-only field indicating who actually possesses the item. Set up values with Generalized Codes Maintenance for field isb_owner.

Location. A reference-only field that describes, in up to 24 characters, the current location of this installed base item at the end-user site. This might be a building location, suite number, or floor.

Status. A user-defined code indicating the status of this installed base item; for example, BETATEST or OBSOLETE. Set up status codes in Generalized Codes Maintenance for the field isb_status.

New Serial. Use this field to change the serial number for an item already in the installed base.

Tip
For a large company, you might enter the department or individual that uses the item.

Installed Configuration Maintenance

Use Installed Configuration Maintenance (11.3.5) to create and maintain product structures in the installed base. You can create parent-component relationships directly with this function, or modify product structures created in other parts of the system.

Creating ISB Records During Invoice Post

You can let the system add items to the installed base as you sell them. Creating records this way minimizes the data entry required to update the installed base.

Invoice Post creates installed base records for parent and component items from sales orders when these settings are in place:

- Ship to Installed Base is Yes in Service Management Control (11.24).
- For components to be added, Load Available Structure must be Yes in Service Management Control and the conditions required for it to be in effect must be true.
- Installed Base must be Yes in Service Item Maintenance (11.3.7) for the parent item and for each component item to be added.

See “Load Available Structure” on page 39 for details.

The system creates the actual ISB record when you post the invoice for the sales order, minimizing the cleanup required if you find mistakes on the pending invoice. If sales shipment created the ISB record and you change the invoice later, the ISB record may be wrong.

When the system creates an ISB record during Invoice Post, it includes the sales order number, line item number, and invoice number. You can use these fields later as search criteria. Invoices created for both standard sales orders and RMAs create or update installed base records.

ISB Records from Sales Orders

If Installed Base is Yes in Service Item Maintenance (11.3.7) for a sales order line item and the other settings are correct in the control programs, the sales order program uses default values to create ISB records. The system bases these values on data for the item in Service Item Maintenance. The end user is the ship-to address on the sales order.

Note You cannot add memo items to the installed base from Sales Order Maintenance, since the system creates the ISB record only if the item is predefined in Service Item Maintenance.

Set SO Edit ISB Defaults to Yes in Sales Order Control to override default values during Sales Order Maintenance. The Installed Base Detail frame displays.

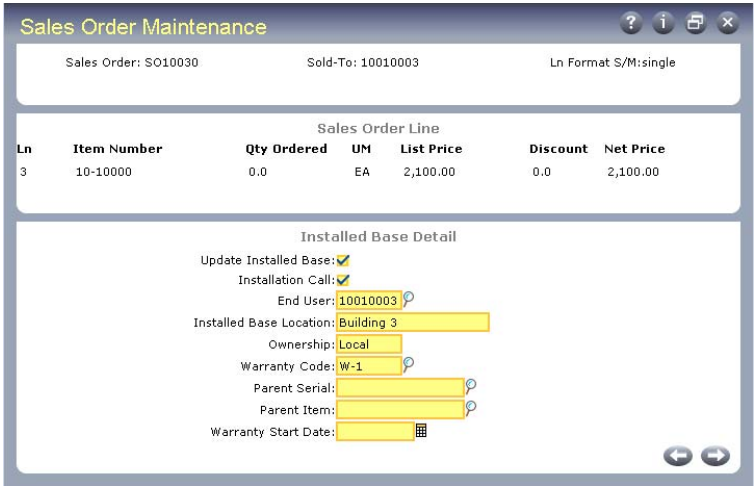


Fig. 2.19
Installed Base Detail in Sales Order Maintenance (7.1.1)

Some of the fields on this pop-up correspond to fields in Service Item Maintenance. The values there default into the corresponding fields in the pop-up: Update Installed Base, Installation Call, and Warranty Code. Edit the default values to control whether to include items in the installed base on a line-by-line basis.

The end user defaults from the ship-to address on the sales order. You can use Installed Base Location and Ownership to add information for the installed base record.

Tip
If the item being sold is part of a configured item, you can specify a parent item and serial already in the installed base for the current end user, and the system adds the new item as part of that configuration.

Use Parent Serial and Parent Item only if you want the item being sold added to the installed base as a component of another installed base item.

The warranty start date defaults to blank. If you do not specify a date, the system uses the sales order ship date as the warranty start date when Invoice Post creates the installed base record.

The system calculates the warranty end date by adding the warranty duration to the warranty start date. If you specify a warranty start date, the system uses it to calculate the warranty end date when it creates the installed base record. If the field is blank, the system bases the warranty start date on the sales order ship date during Invoice Post. If Invoice Post creates an installation call, the system bases the warranty start and end dates on the call closure date.

The system updates the warranty start and end dates *only* if you have not specified a date. For the system to manage this date, leave the field blank.

Note If this item requires an installation call and you do not specify a warranty start date, the system recalculates the warranty start and end dates when you close the install call. The system never overrides dates you specify.

The system obtains other information that is part of the installed base record from the sales order: item number, quantity, serial number, lot/reference number.

Removing ISB Records for Sales Order Returns

If you update the installed base from sales order shipments, you need to delete installed base records when a customer returns items. A negative order quantity on the sales order line indicates a sales order return. When you ship this line and post the invoice, the system can remove the installed base record.

For this to occur, the setting of SO Returns Update ISB in Sales Order Control must be Yes. The other conditions that update the installed base must also be true. For example, Ship to Installed Base must be Yes in Service Management Control.

Also, some quantity of this item must be in the installed base. To uniquely identify the item you want to remove, enter the installed base reference, which appears on the Installed Base Detail pop-up when you have satisfied the above conditions.

Sales Order Maintenance (7.1.1) or Pending Invoice Maintenance (7.13.1) are the only places you can specify the ISB reference, and you can specify only one reference per sales order line. This has two implications:

- If you want to return more than one item, you must create a separate line item for each.
- You must enter the line in Sales Order Maintenance before you use Sales Order Shipments (7.9.15) to specify a negative quantity.

Note The installed base pop-up displays in Sales Order Maintenance for a return even if SO Edit ISB Defaults is No in Sales Order Control. Unlike other installed base parameters, the system cannot create a default for the ISB reference—you supply it. The same is true of Pending Invoice Maintenance when Pending Invoice Update ISB is No in the control program.

If the system cannot find the item, serial, and reference in the installed base for the end user on the sales order, a warning displays. A warning also displays when the installed base quantity does not match the line item quantity.

Posting the sales order invoice deletes the installed base record. When the system updates the installed base, it writes a message to the ISBPST.prn file confirming deletion or describing any error that prevented it.

ISB Records from RMA Maintenance

RMA receipts and issues create a special form of sales order. Like any other sales order, invoices for RMAs update the installed base. Items on an RMA can also generate installation calls.

You can change default installed base information in an RMA, just like a sales order by setting Edit Installed Base to Yes in RMA/RTS Control. For instance, if you need to define an end user on a line item that is different from that specified on the header, you can change the end user line-by-line.

RMA Maintenance adds records to the installed base and removes them. If you issue an item in place of a returned item, RMA Maintenance removes the old record and replaces it with the new.

Installed Base Invoice Post Report

When Invoice Post updates the installed base, the system puts messages in your local directory about ISB records it created and errors it encountered. This file is `ISBPST.prn`.

The file lists items by customer and sales order (or RMA). This file is re-created each time you run Invoice Post, but the system adds data only when you update the installed base.

Messages in `ISBPST.prn` depend on the kind of update. The following messages may occur during delete from RMA and sales order returns.

- Configuration deleted. This indicates the system deleted the parent item's lower-level configuration.
- ISB quantity reduced. This indicates the system reduced the installed base quantity for the parent item and its structure. This occurs when items in the installed base have a quantity greater than one, and a quantity less than that is returned.
- ISB structure deleted. This message prints when you attempt to delete a corrupted installed base structure.
- Item deleted. Indicates the system has deleted the top-level parent item.
- Item quantity reduced. Indicates a return has reduced the installed base quantity of a level 1 item without components.
- WARNING: Part received not in ISB. The item being returned is not in the installed base.
- WARNING: Greater than ISB quantity returned. The ISB quantity of an item is less than the number of items returned.

ISB updates, such as sales orders and RMA issues, generate the following messages:

- Item master record is missing. If Items must Exist is Yes in Service Management Control and you ship a memo item on a sales order with Update ISB set to Yes, this message displays. This event should not normally occur.
- End user record created. The system creates an end user if the end user on the sales order does not exist yet.
- Warranty code record is missing. If the warranty code specified for the item during sales order shipment or associated with the item in Service Item Maintenance does not exist, this message prints.
- Check for deletion. This message should not occur during normal operation. It indicates that the routine attempting to update the installed base has detected a record indicating this item should be removed from the installed base.
- Part already in ISB. This message only occurs for lot- and serial-controlled items. A record already exists for this item number and serial number.
- Part created. Indicates the system has created an installed base record for the item shipped.
- Missing warranty code. This message displays when the sales order or RMA warranty code is not valid for a new installed base record.

ISB updates generate the following messages when Load Available Structure is Yes:

- Part serial already exists. This message occurs only if one of the lower-level items in the configuration is serialized and already exists under a different end user. The system adds the component under the current end user with the next reference number.
- Configuration created. Indicates the system is adding this item as a component of the parent.
- Remote DB - Parent level parts only. This message displays in a multiple-database environment when an attempt is made to add a configuration structure to a remote database. Only parent items are added in this situation.

Creating ISB Records from Calls

If Items in Installed Base is No in Service Management Control, service personnel can take calls for items that are not yet in the installed base. When you record activity for the call in Call Activity Recording, you can create an installed base record for the call item and for items issued in CAR.

Set Update ISB to Yes for each line item you want added to the installed base. The repair quantity must be the same as the quantity on the ISB record.

Call Maintenance

Call Maintenance (11.1.1.1) sets up default values the system uses to update the installed base. Normally, the updates occur in Call Activity Recording. You can, however, close calls directly from Call Maintenance. Even though Update ISB is Yes, when you close a call in Call Maintenance for an item that is not in the installed base, you are prompted:

```
Create installed base record?
```

Respond Yes to direct the system to create an ISB record for items on the call for which Update ISB is Yes.

Call Activity Recording

In the normal life cycle of a call, engineers record some activity for each line in Call Activity Recording. CAR updates the installed base in three ways: the call line item, any items issued to repair it, any items returned.

Call Line Item

If the call line is for an item not in the installed base and Update ISB is Yes, a frame appears in CAR for recording installed base information. You create the ISB record directly at this point, not later during Invoice Post.

The installed base is updated during the initial phase of recording activity so it can be correctly updated when issue inventory items are issued. For these records to be added as components of the parent item, the record for the parent item must already exist.

You can also add call line items to the installed base as components of another parent item.

Swaps

In CAR, you can issue as a repair item the same item number reported on the call line. The system treats the transaction as a swap by removing the call line item from the installed base and replacing it with the item issued.

Repair Items Issued

You can create installed base records in CAR for items the system issues during inventory transaction processing. Create these records the same way you create other ISB updates: set Installed Base to Yes in Service Item Maintenance and Ship to Installed Base to Yes in Service Management Control.

Also set Load Available Structure to Yes in Service Management Control. Otherwise, the system adds only parent items to the installed base item.

If the call line item has a structure, the system adds items you used to the installed base as top-level components of the call line item.

Returned Items

You can return items in CAR as part of an exchange and remove ISB records for the returned items from the installed base. During an exchange, you supply the installed base reference number for non-serialized items. Then during inventory issue, the system removes the old reference or serial number and replaces it with the new one.

If a call, call history, or service contract exists for the returned item for this end user, you cannot delete its record unless it is a swap. The system updates the installed base and prints a message. The system assumes you will either repair the returned item and send it back to the customer, or you will modify the contract, and add a new line for this item.

Installed Base Utilities

SSM provides utilities for other installed base needs. These functions:

- Alert end users to product recalls with field notifications.
- Move installed base items from one end user to another.
- Generate marketing letters for a range of installed base items.

See “Call Generator” on page 407 for details.

Field notifications work in conjunction with Call Generator. Also, when you need to generate calls for a range of installed base items or end user and item combinations, the Call Generator utility generates these calls.

Field Notification

Many organizations track installed base information because of the possibility of product recalls. This is a concern, for example, for medical equipment manufacturers. Recalls associated with documentation and auditing requirements from regulatory agencies may require extensive audit history and control.

You can use SSM’s field notification utilities to manage the recall process.

- Use Field Notification Maintenance (11.3.12.1) to create and maintain a field notification. The field notification defines, groups and manages related calls, and maintains history. The system closes the field notification when you close its associated calls.
- Use the Call Generator (11.1.8) to generate calls associated with an existing field notification, or create a new field notification and generate calls for it.
- Use Field Notification Inquiry and Report (11.3.12.2 and 11.3.12.3) to display information associated with a field notification.
- Use Field Notification Delete/Archive (11.3.12.23) to remove a closed field notification from the system and delete obsolete history records. The field notification history includes information about the selection criteria for items, the first and last call associated with the notification, and open and close dates.

Figure 2.20 illustrates the field notification work flow.

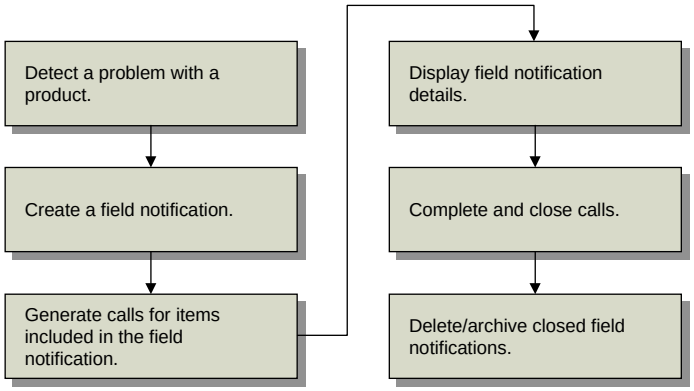

Detect a problem with a product.
Create a field notification.
Generate calls for items included in the field notification.
Display field notification details.
Complete and close calls.
Delete/archive closed field notifications.

Fig. 2.20
Field Notification Work Flow

Effect of Field Notification

The system handles calls generated from a field notification in special ways:

- It adds the field notification number to the call record. When you update one of these calls, a message displays the source of the call.
- Call values for the field notification take precedence over other call defaults. The system does not use call defaults associated with the work code on the field notification, and uses an end user escalation only if one is not on the field notification. The call's next status defaults from Call Status Maintenance. Call duration defaults from Service Management Control if you use one of its work codes.
- You cannot move a closed field notification call to history unless all related calls are closed. The system automatically closes the notification when you close or cancel all calls associated with it.

Tip
Recalls normally use either the Update or Corrective work code.

Coverage for Field Notifications

The calls generated from a field notification have unique coverage needs. You do not normally charge these calls to contract or warranty coverage. For example, if you generate the field notification as a result of a product defect, you do not want to consume an end user's contract coverage.

Field Notification Maintenance lets you override any existing coverage. When you choose this option, you can specify a service type for the calls the field notification generates. If you use existing coverage, select between contract and warranty coverage for those items in the installed base covered by both.

If you do not override coverage but do specify a default service type, the system uses it instead of the Default Call Service Type in Call Management Control for items without either warranty or contract coverage.

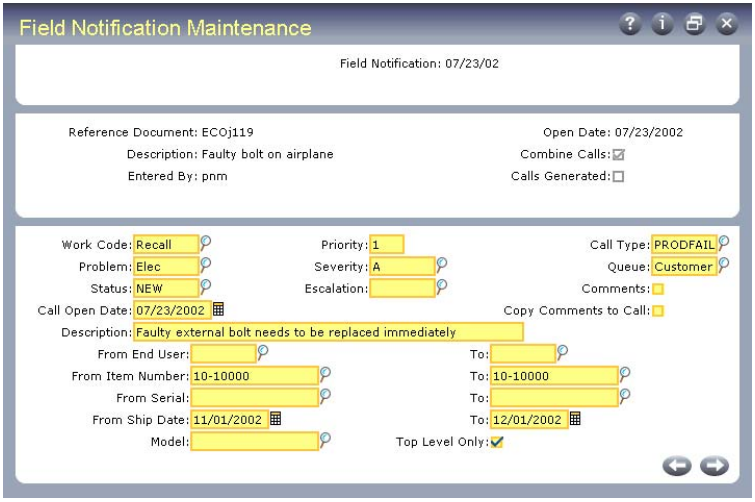
See “Charge Codes” on page 103.

Choose the override service type carefully. Make the default under-limit charge code on the service type a covered charge code, rather than a contract or warranty charge code.

Field Notification Maintenance

Create field notifications with Field Notification Maintenance (11.3.12.1) or with the Call Generator. Similar frames display in both.

Fig. 2.21 Field Notification Maintenance (11.3.12.1)



When you create a field notification, you can associate a document—an ECO documenting the problem and product change required, or some kind of internal reference document. You can also combine an end user’s items into one call.

The remainder of the maintenance fields specify attributes of the call and selection criteria for the items in the installed base. The system generates a call or call line for each item.

Field Notification. Enter a code of up to eight characters identifying the field notification.

Reference Document. If you associate this field notification with another document, enter its identification. Twenty-four characters are allowed.

Description. Enter up to 24 characters describing this field notification.

Entered By. Defaults from the ID of the user logged into this session.

Open Date. Defaults from the system date, and indicates the date you opened this field notification. You can only change Open Date when you first create a notification.

Combine Calls. Specify Yes to generate one call for each end user. The system creates multiple lines for each installed base item for this end user. Specify No to create one call for each installed base item.

Calls Generated. Indicates whether you have generated calls for this field notification. The system sets it to Yes after you run Call Generator for this field notification.

Work Code. The default is blank. Enter a work code defined in Work Code Maintenance to be associated with calls generated for this field notification's calls. Other call defaults created in Call Default Maintenance are not used. The system derives call values from the field notification.

Problem, Status, Description, Priority, Severity, Escalation, Call Type, Queue, Description. The system applies these values to the calls you generate for this field notification. The values take precedence over any other defaults. For example, the system applies an end-user escalation only if the field notification does not have one.

Call Open Date. Defaults from the system date. A call open date gives you more control over when the system processes the calls.

Comments. Defaults to Yes if comments exist; otherwise defaults to No. If Yes, the standard transaction comments frame displays when you press Go, so that you can enter or review comments related to this field notification. You can copy comments into each of the calls generated by this notification.

Tip
Use Copy Comments to Call to print special instructions or notes on the call or call invoice.

Copy Comments to Call. Defaults to No. Indicates if the system copies comments associated with this field notification into each call generated.

From End User/To. Leave blank or specify a range end users for selecting installed base items.

From Item Number/To. Leave blank or specify a range of installed base items.

From Serial/To. Leave blank or specify a range of serial numbers for selecting installed base items.

From Ship Date/To. Leave blank or specify a range of ship dates for selecting installed base items.

Model. If you are tracking installed base items by model number, enter a model number in this field to include only items with this model in the calls generated.

Top Level Only. Set to Yes to create call lines only for parent items. Set to No to create call lines for each item in the installed base configuration.

Generating Field Notification Calls

See “Call Generator” on page 407 for details.

From the Call Generator (11.1.8), specify F as the input source to generate calls associated with a field notification. You are prompted to enter a notification number.

Fig. 2.22
Generating Field Notification Calls

If you enter a non-existing value in the Field Notification field, you are prompted to create it. Respond Yes to create a field notification directly from the Call Generator. If the notification you enter exists, you are prompted to review it. Respond Yes to this prompt to redisplay the Field Notification Maintenance frames and update the call definition or selection criteria.

Once you specify or create the field notification, the final Call Generator frame displays. You can only update four fields.

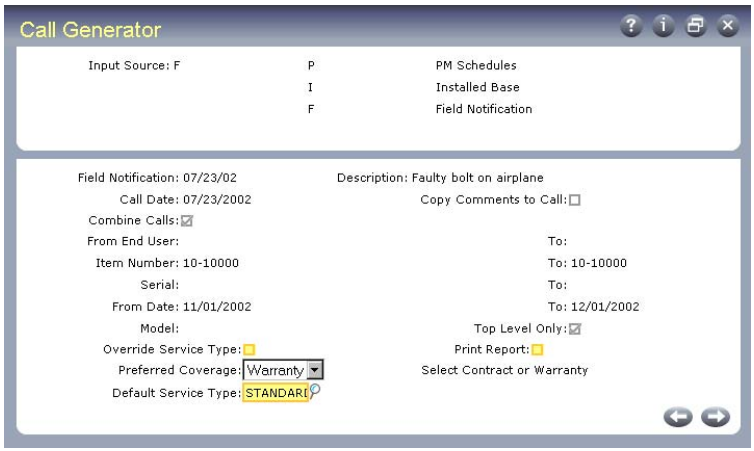


Fig. 2.23
Generating Field Notification Calls

Override Service Type. A Yes in this field indicates you want to use a different coverage than is normally attached to the item in the installed base. No directs the system to use the normal contract or warranty coverage. If No, you can choose between contract and warranty coverage for those items in the installed base that are covered by both.

If Yes, enter a valid service type in Default Service Type for coverage terms. If No, you can still enter a value for Default Service Type. The system uses the value instead of the Default Call Service Type in Call Management Control for installed base items without coverage.

Preferred Coverage (Warranty/Contract). The system uses this field if overlapping coverage exists for an installed base item and Override Service Type is No.

Default Service Type. The effect of this field depends on Override Service Type. If Override is Yes, this field determines the terms and conditions of coverage for calls generated by this field notification. If Override is No, this field is optional and determines the terms and conditions only for call items that do not have current warranty or contract coverage.

Tip
Set to Yes to run in batch.

Print Report. Indicate whether the system should generate a printed report listing the calls created. If Yes, you are prompted for an output device for the report and Batch ID. If No, a report is not generated, but a message does display when execution completes indicating the number of calls created and the range of call numbers.

Deleting and Archiving Closed Field Notifications

After you close or cancel the calls associated with a field notification, you can delete and archive the notification with Field Notification Delete/Archive (11.3.12.23).

Fig. 2.24
Field Notification Delete/Archive (11.3.12.23)

Select records to be deleted by number or by completion date. You can include history records or retain them for potential reference.

Moving Items in the Installed Base

Use Installed Item Move (11.3.13) to update the location of installed base items from one end user to another.

This function is especially useful for corporations that move equipment between divisions and diverse locations. Normally, if the item you are moving has a component structure in the installed base, the system moves the items with it. However, you can move components of a configured item to a new site.

Example A company has computer systems at different sites and moves components of the different systems, such as disk drives, from one site to another. Using Installed Item Move is easier than altering the installed configurations of each computer system by deleting one component and adding another.

You can also use this function if you often take calls from unknown end users. This is typical for organizations that sell to retail outlets. Associate the end user with a temporary customer during Call Maintenance. Later, you can create a new customer for this end user, then move the installed base item.

Restrictions

Moving items in the installed base has two restrictions:

- The item to be moved and any of its components, if it has an installed configuration beneath it, cannot be referenced by:
  - A call
  - A contract with either current or future coverage
  - An unprocessed RMA receipt line

  All of these functions depend on installed base information that is rendered invalid by moving the item. Clean up open calls, contracts, or RMAs before attempting to move the item.
- If the end-user type of the target end user does not match the type of the source end user, a warning displays. Since warranty terms can vary by end-user type, an item's warranty may not apply to a different type of end user. Use the recalculate coverage option to modify the warranty type, installation date, and warranty expiration date.

Move Date

To move an item in the installed base, enter a source and target end user in Installed Item Move, illustrated in Figure 2.26. You can specify the actual move date. The default is today. The system uses this date to check for contract and warranty coverage.

Tip
If MTZ is active, enter the move date relative to From End User's time zone.

If you change the default Move Date value, it is most often to a date earlier than the current one. If you set the date ahead, service coverage for the From End User might not be valid, and warranty coverage for the To End User is not valid until the install date.

Recalculating Coverage

If you are moving an item with warranty coverage, the coverage may no longer be appropriate for the new end user. Specify Yes to Recalculate Coverage to choose coverage options.

Fig. 2.25
Installed Item Move (11.3.13)

You can clear the warranty coverage for the new end user. Or you can modify the coverage by specifying an alternate warranty and installation date, and by requesting the system to recalculate the warranty end date for the item based on the new install date.

Selecting Items to Move

Next, a lookup displays the parent-level installed base items for the From End User. Only top-level items display, since they are the ones you usually move.

Select the items you want to move. An asterisk (*) in the leftmost column indicates selection. Press Go to move the items and their components to the To End User.

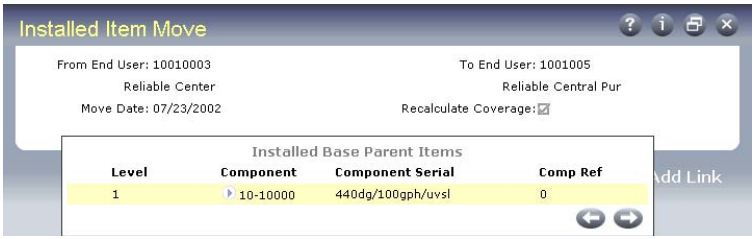


Fig. 2.26
Installed Item Move (11.3.13)

You can add more items to move manually on the next frame.

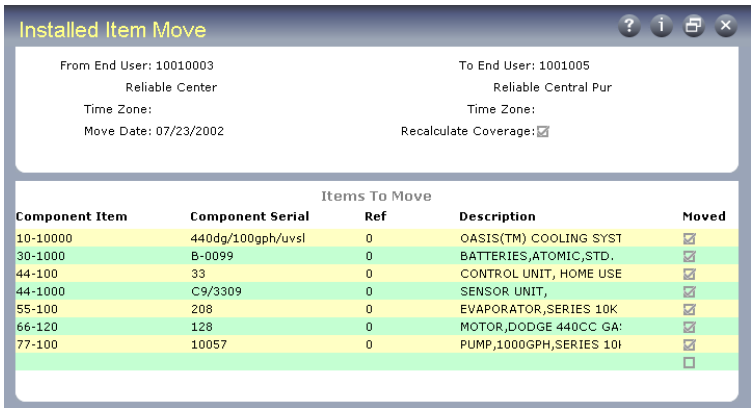


Fig. 2.27
Manual Entry in Installed Item Move

When you finish moving items and press End, the system prompts you for an output device and generates a report listing the items moved, their installation dates, and associated warranties. Ensure that this information is correct for the new end user.

Generating a Service Marketing Letter

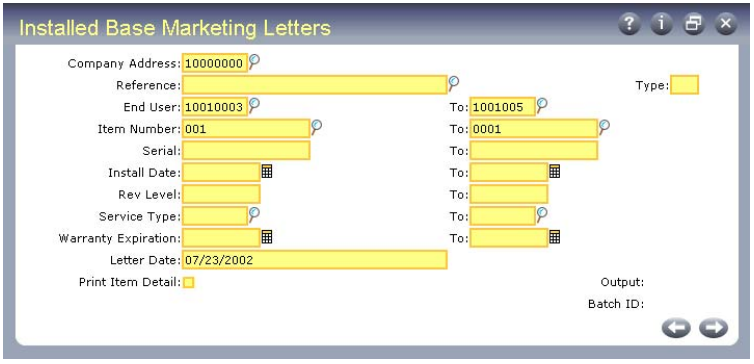
Service usually involves direct communication with the end user. At times, it is necessary to contact a range or all end users in the installed base, perhaps to alert users to a new product upgrade, or warn them of a product defect.

Use Installed Base Marketing Letter (11.3.21) to create such letters. You can base the letter on comments you created in Master Comment Maintenance (1.12). To generate a letter to all users in the installed base, follow these steps.

1. Write a master comment in the form of a letter in Master Comment Maintenance (1.12). Write the comments in each required language. When the system generates the letter, it looks for comments in the addressee's language.

2. From Installed Base Marketing Letter (11.3.21), specify the master comment in the Ref and Type fields, then the options for selecting the end users to receive letters.

Fig. 2.28
Installed Base Marketing Letters (11.3.21)



Tip
If you use pre-printed letterhead, leave the address code blank.

Company Address defaults from Contract Control. Select end users to receive letters based on item number, serial, install date, revision level, service type, or warranty expiration. For example, you can create letters for end users who have items with warranties about to expire.

Letter Date accepts a free-form date description to print at the top of the letter. If Print Item Detail is Yes, the system also prints a list of attributes for the installed base item at the top of the letter.

Figure 2.29 illustrates a sample marketing letter.

Fig. 2.29
Sample Marketing Letter

```
Quality Products Inc.
Manufacturing Division
One World Way
Los Angeles, CA 93111

June 5, 2002

Lakewood Distributors
32 South Maple
Minneapolis, MN 54221

Attention: John Smith

         Regarding Item: 19000
         Description: Electrical Generator
         Model:   43-12
         Serial:  MT137

The warranty on your electrical generator expires on July 1, 1999. Our
company offers an excellent service contract that will extend warranty
coverage at a very reasonable price.
```

Chapter 3

Service Setup

To implement the Service/Support Management (SSM) module, plan carefully and consider in detail your business needs and requirements and how they map to functions in SSM. This chapter concentrates on the setup functions in the Service/Support Setup menu (11.21) and includes a list of generalized codes used in service functions.

Service activity uses the codes this chapter introduces to direct and manage the flow of charges and credits. Call Activity Recording, especially, relies on codes. They also define service limits.

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Charge and Revenue Management **103**

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Generalized Codes for Service **119**

Overview

See Chapter 23, “Control Programs,” on page 745 for details on control program settings and their effects.

The codes discussed in this chapter support recording engineer activity, applying charges, and tracking inventory effects with product lines.

Charge Codes

With charge codes, you can indicate who is responsible for paying for service activity you record in Call Activity Recording. Charges may be warranty, contract, covered, billable, fixed billable, project, or giveaway for each item and each call. Charge codes give service personnel the freedom to make effective business decisions for every detail they record while handling a call.

Example In many markets, repairing a troublesome item for free or using a goodwill replacement helps preserve an important customer relationship. However, you probably do not want to provide all service on the call at no charge.

Charge codes can designate a particular item as giveaway, yet keep normal billing for the rest of the service and items on the call. Service personnel can implement a decision quickly and efficiently by changing the charge code on the troublesome item for this call.

Service Limits

Invoice sort, service category, and work codes create a flexible way to design warranty and contract types. You can create as many work codes and service category codes as you need, and combine them in almost unlimited ways.

With the combination of invoice sort or work code and service category you can track and manage service activity at a summarized level, or with as much lower level detail as you need.

Product Lines

Charge and revenue product lines control the flow of service activities into appropriate GL accounts. Separating costs and revenue by product line permits sophisticated accounting and reporting. For example, you can

separate income generated by warranties from that generated by contracts. Or you can create accounts for installation activity that are distinct from repair activities.

Return Statuses and Default Sites

Return status codes manage the return of items in Call Activity Recording. These codes determine if the system should look for an exchange price and which default site it should use for the return. You can define default sites that direct returned items to repair centers depending on the type of item, the geographical location of the end user, or other relevant factors.

User Preferences

Service/Support User Preferences enables each user to control certain features of service processing. You can allow each user to specify preferences or use standard system security to prevent or limit access.

Recording Service Engineer Activity

Service/Support Management manages engineer activity with combinations of settings for the work codes, charge codes, invoice sorts, and service categories discussed in this chapter. You can tailor these codes to business requirements.

Call activity and invoicing functions use these codes to track such information as labor performed, items consumed and returned, and expenses.

Work Codes

Work codes designate what type of work personnel perform during service activity. You generally break work codes into broad areas of service that reflect your service organization's structure. Work codes, in combination with other features, control the flow of call activity into GL accounts.

For example, a work code can identify preventive maintenance (PM), technical work (TECH), emergency calls, a specialized type of repair, or overtime. You can define anything an organization needs to track as a work code.

Work code definitions should correspond to how the service organization bills for work. If you want to bill only for repair center work, then define a repair work code (such as REPAIR). Work code definitions can be quite sophisticated. Levels of skill specialization, time periods, departments, pay scales, and so on can be criteria for defining and organizing work codes.

Typically, manufacturing companies want their service and support tracking to be as straightforward as possible. It is often better business practice to keep work codes simple. However, if needed, you can set up and track work codes for complex service organizations.

Default Work Codes

Call Management Control defines five default work codes. These defaults represent typical kinds of work in a service environment and have a built-in meaning to the system. You can define as many other work codes as you need.

- *PM Work Code*. Default work code for calls the system generates as part of a preventive maintenance schedule.
- *Update Work Code*. You can assign this work code a meaning, such as a product upgrade.
- *Install Work Code*. Default installation call type. When items requiring installation are added to the installed base from sales order shipment, the system generates a call of this type.
- *Corrective Work Code*. Default work code for a call requiring mass recall or some kind of legal action.

- *Technical Work Code*. Default work code for all other calls you create with Call Maintenance (11.1.1.1) or Call Quote Maintenance (11.1.1.7).

You can associate a default call length with each work code. Call Maintenance uses it to calculate engineer load for each type of call.

Some companies use one or more generic work codes instead of codes for each of these call types. Other companies need more than these five codes—a work code for testing or installation preparation, for example. Create as many work codes as you need to meet your business requirements.

Applying Work Codes

Most service activities require work codes. Functions including call defaults, call escalations, coverage limits, price lists, default sites, charge and revenue product lines, and CAR use them.

Call Defaults

Work codes represent the types of work you do. You can set up call defaults based on work code in Call Default Maintenance. Call Maintenance then uses these defaults, such as queue, call duration, and severity, to define calls for the corresponding kind of work.

Call Escalation Sequences

You can base call escalation sequences on work code. This is useful, for example, when repair calls follow a different sequence of escalation steps than preventive maintenance calls.

Coverage Levels

When you define coverage levels for warranties, contract types, or contracts, you can base them on work code and service category combinations or invoice sorts. Work codes support a more detailed breakdown by the type of work. Use work codes to specify, for example, that the limit for preventive maintenance work is $100, but the limit for repairs is $200.

Price Lists

If you use work codes in price lists, you can charge different prices depending on the kind of work. For example, you might price installation labor higher than preventive maintenance.

Default Sites

You can base return sites and locations on work code. This is useful if you do different kinds of work at different physical sites or locations. For example, you might return items requiring PM service to different locations than items requiring repair.

Charge and Revenue Product Lines

Service product lines based on work code can track the costs and revenue generated by different kinds of work. You can, for example, separate the income generated by preventive maintenance from the income generated by repairs. You can also base default charge codes on a work code. Call Activity Recording uses charge codes and charge product lines; Call Invoice Recording uses revenue product lines.

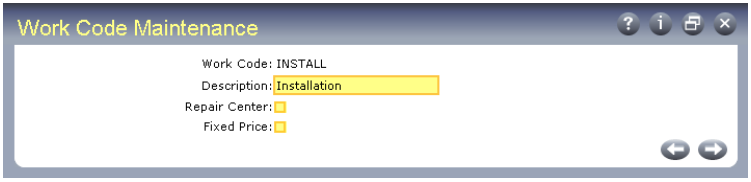
Call Activity Recording

Call Activity Recording and Call Invoice Recording use work codes to determine the coverage in effect and which charge code to use. For example, the system suggests a fixed price charge code for a fixed price work code.

Work Code Maintenance

Use Work Code Maintenance (11.21.1) to create and maintain work codes. Figure 3.1 shows an example of a work code for installation work.

Fig. 3.1
Work Code Maintenance (11.21.1)



Work Code. Identifier you define for a particular work code.

Description. Enter up to 24 characters describing the code and identifying its use and purpose.

Repair Center. Yes means you do this work at a repair center. This field is for reference only.

Fixed Price. Yes means you charge a fixed rate for this kind of work. When you record activity for a call with this work code, the system uses fixed pricing and suggests a fixed price charge code.

Invoice Sort Codes

Invoice sort codes are important for Call Activity Recording and Call Invoice Recording. They provide a high-level sorting tool for grouping service costs by items, labor, and expenses. These groupings apply to service limits and printed invoice presentation, set defaults for invoice detail, and determine whether or not to include fixed price costs in totals.

Although you can define any number of invoice sorts, Call Invoice Recording can display only six. The three basic invoice sorts—labor, items, and expenses—cover most requirements. You define their names.

If you use fixed pricing, also define an invoice sort for fixed prices.

Applying Invoice Sort Codes

Invoice sort codes have four main applications in the system: they define service categories and service limits, affect the presentation of invoice information, and determine invoice detail.

Invoice Sorts and Service Categories

When you define service categories, they must reference an invoice sort of the proper type—either item, labor, or expense. The system summarizes the detailed information for the various service categories under the related invoice sort code.

Service Limits

You can set up service limits and levels of coverage on warranties and contracts by invoice sort. Call Activity Recording applies these limits and levels. When the limits on the service type or contract are in terms of invoice sort codes, the system tracks activity for the service categories related to each sort code. The system suggests either an under-limit or over-limit charge code based on this consumption.

Invoice Presentation

After you record activity for a call, the invoice sort determines how Call Invoice Recording displays the financial summaries. Call Invoice Recording provides a high-level financial summary of call costs and billable amounts. The top frame (costs) is a grid with the three types of invoice sort codes as the columns and charge codes as the rows.

The final frame of Call Quote Maintenance is similar. The system summarizes planned labor, parts, and expenses for a service activity just as in Call Invoice Recording.

Some invoice sort fields affect the display of information in CIR.

Type

The value in Invoice Sort Maintenance for the Type field determines which column displays invoice sort information. When you define an invoice sort, match the Type value to the invoice sort's label. For example, an invoice sort called Expenses with a Type of L for labor would be misleading.

Display Order

Invoice sort codes display in the rows of the Billing Summary frame of Call Invoice Recording. The Display Order field determines the order in which they appear. Define the labels in the Label field. Multi-language users can define labels for each language.

A warning displays if you create two invoice sorts with the same display order. The system does not prevent this, but the display in Call Invoice Recording will be confusing.

Fixed Prices

Fixed prices represent a single price for the entire service activity, regardless of the list price of individual items. Since the prices are not broken out by expense, labor, or item, mark one invoice sort to include fixed price amounts. The Billing Summary frame of Call Invoice Recording still breaks out costs, but the price displays only if an invoice sort with Fixed Price set to Yes is defined.

Since fixed prices are not broken out by service category, do not associate service categories with this invoice sort; use it to display fixed prices. A warning displays if you associate service categories with a fixed price invoice sort.

Language

Invoice sort codes control the display in Call Invoice Recording and invoice print. Multi-language users can specify how the label for the invoice sort appears in different languages.

Invoice Detail

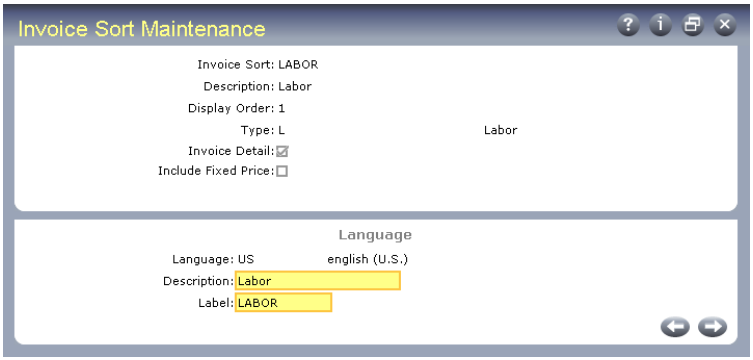
The Detail field determines the default in the Det column of Call Invoice Recording, unless you specify a different invoice format for the end user in End User Address Maintenance. This field, in turn, determines the level of detail on the printed invoice. When Detail is No for an invoice sort, the system takes the entries for a service category, summarizes them in a single line item, totals them, and then prints only this total on the hard copy invoice.

See “Invoice Format” on page 30 for details.

Invoice Sort Maintenance

Use Invoice Sort Maintenance (11.21.5) to define and maintain invoice sort codes. Figure 3.2 shows a sample invoice sort for labor.

Fig. 3.2
Invoice Sort Maintenance (11.21.5)



Invoice Sort. Enter a code identifying this invoice sort.

Description. Enter up to 24 characters describing the code and identifying its use and purpose.

Display Order. Enter a numeral from 1 to 6 representing the display sequence in the Billing Summary frame of Call Invoice Recording. A warning displays if another invoice sort has the same display order.

Type. Possible values are L for labor, E for expense, and I for item. Type determines the column where costs display in the Call Invoice Recording summary frames. Labor costs display in column 1; item costs in column 2; and expense costs in column 3.

The invoice sort type also determines which service categories you can associate with it. You can associate a type L invoice sort with labor and travel labor service categories, a type I invoice sort with items, consumable items, or exchange items, and a type E invoice sort with expense or travel expense.

Invoice Detail. Determines the default in the Detail column in the Billing Summary frame of Call Invoice Recording and affects the printed invoice format. If Yes, the printed invoice displays information for each line of activity recorded in CAR. If No, the system summarizes the lines for a particular invoice sort with totals only. This means that if you consumed five items, the total cost for the five items displays, without details about the cost of each.

You can also set invoice detail per end user. The end user value overrides the invoice sort value.

Include Fixed Price. If this is Yes, Call Invoice Recording includes fixed price repair amounts in output for this invoice sort. Set only one invoice sort to Yes. Since fixed prices are charged regardless of the cost of items, labor, or expenses and regardless of the service categories in Call Activity Recording, do not associate service categories with this invoice sort.

Language Frame

Invoice sorts control the invoice display in Call Invoice Recording and invoice print. Use the language frame to specify how the label for the invoice sort should appear in different languages. If you do not set up language-dependent labels, the system uses the first 14 characters of the invoice sort description for the label in the Billing Summary frame of Call Invoice Recording.

Language and Description. Enter any valid language code from Language Code Maintenance. If blank, the system uses the base language. Once you enter a language code, the description associated with it displays.

If you use more than one language, execute the next description and label sequence for each language you use. The description and label then appear properly translated for users in each language.

Description. Specify a general description of this invoice sort for the current language. For example, if the invoice sort applies to expenses, this description field might be “General Expenses.”

Label. The string in this field appears in the Call Invoice Recording Billing Summary frame as the label for this invoice sort when you are using this language. It displays in the position you define in the Display Order field.

Example in Call Invoice Recording

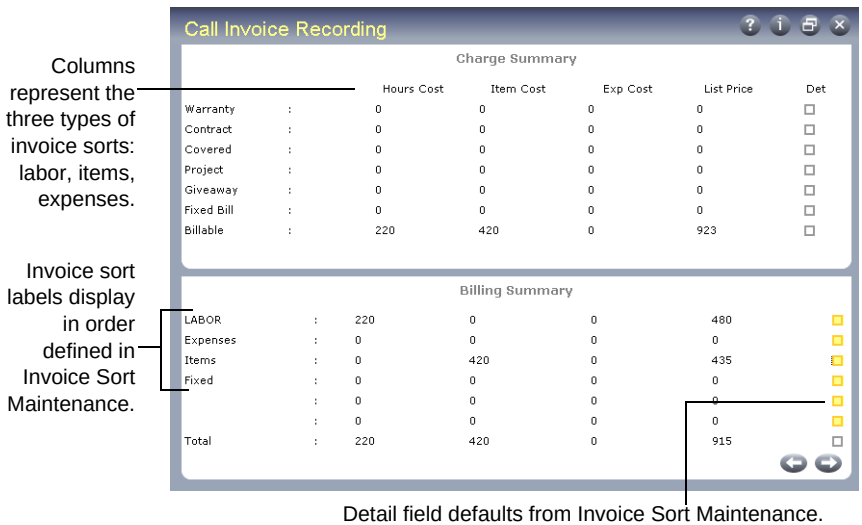
To understand how invoice sorts appear in Call Invoice Recording, consider this scenario. A company sets up the invoice sort codes shown in Table 3.1.

Table 3.1
Sample Invoice Sort Codes

Label	Display Order	Type	Detail
LABOR	1	L	No
Expenses	2	E	No
Items	3	I	No
Fixed	4	E	No

The summary frames in Call Invoice Recording would look like Figure 3.3.

Fig. 3.3
Summary Frames in CIR


Columns represent the three types of invoice sorts: labor, items, expenses.
Invoice sort labels display in order defined in Invoice Sort Maintenance.
Call Invoice Recording
Charge Summary
Hours Cost
Item Cost
Exp Cost
List Price
Det
Warranty : 0 0 0 0
Contract : 0 0 0 0
Covered : 0 0 0 0
Project : 0 0 0 0
Giveaway : 0 0 0 0
Fixed Bill : 0 0 0 0
Billable : 220 420 0 923
Billing Summary
LABOR : 220 0 0 480
Expenses : 0 0 0 0
Items : 0 420 0 435
Fixed : 0 0 0 0
: 0 0 0 0
: 0 0 0 0
Total : 220 420 0 915
Detail field defaults from Invoice Sort Maintenance.

See Chapter 14, “Call Invoice Recording,” on page 515.

The Billing Summary frame displays the labels of the invoice sorts you specify in Invoice Sort Maintenance. The Det column reflects the value for the Invoice Detail field.

Service Categories

Service categories identify specific subsets of the labor, expense, and item invoice sorts. Each service category must reference an invoice sort when you define it. The invoice sort gives a high-level summary of the financial impact of its related service categories.

Each type of service category must be related to an invoice sort of the corresponding type. You can relate Items, Consumable Items, and Exchanged Items only to a type I invoice sort; Labor and Travel Labor only to a type L invoice sort; and Expense and Travel Expense only to a type E invoice sort.

Applying Service Categories

Like invoice sorts, service categories have several uses in the Service/ Support module:

- Define limits and price lists.
- Provide defaults in Call Activity Recording.
- Qualify charge and revenue product lines.
- Define the default taxable status and tax code for labor and expenses.

Service Limits

Service categories manage the financial impact of service activity in CAR. You can define service limits in terms of invoice sort codes or work code and service category combinations. When you take a call, CAR monitors the limits from the call contract or service type. The system suggests either an under-limit or over-limit charge code based on limit consumption.

Service Pricing

You base pricing for labor and expenses in CAR on service category and other selection criteria. You also base expense cost lists on the service category. This means you need enough service categories to reflect both the pricing levels you use for labor and the range of expense costs and prices.

Default Service Categories

When you define service items in Service Item Maintenance, you can associate a default item service category with them. Similarly, you can associate a labor and expense service category with standard operations and service routing steps. These service categories provide default values for CAR, streamline data entry, and ensure consistent input.

Product Lines and Charge Codes

If you use service category in a search key for charge and revenue product lines, you can break out accounts based on the service categories in CAR. You can also set up default charge codes with service category as part of the search key.

Default Tax Data

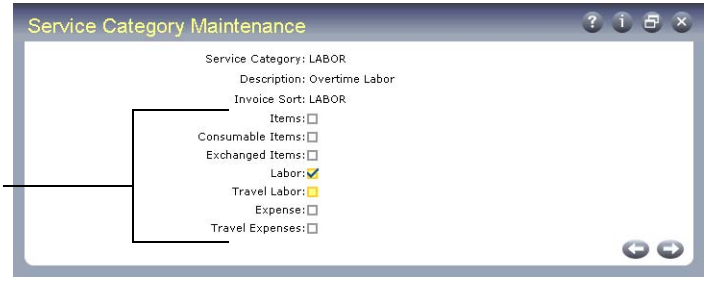
See Chapter 7, “Taxes in SSM,” on page 221 for details about tax implementation.

You can use Item Master Maintenance to assign a taxable status and tax code to items. These provide defaults when the item is entered on various orders, including calls and RMAs. Use Service Category Maintenance to associate tax status and tax codes with labor and expense service categories. Call Invoice Recording uses the taxable status and tax class associated with the service category as the default for labor and expense usage records for taxable call lines.

Service Category Maintenance

Use Service Category Maintenance (11.21.9) to create and maintain service categories. Figure 3.4 illustrates a labor service category.

Fig. 3.4
Service Category Maintenance (11.21.9)



Service Category. Enter a code identifying a particular service category.

Description. Enter up to 24 characters describing the code and identifying its use and purpose.

Invoice Sort. Enter an invoice sort defined with Invoice Sort Maintenance (11.21.5). This field is required and the invoice sort code must exist.

You can set only one of the remaining fields to Yes for a particular invoice sort. The invoice sort type determines which fields you can edit.

- Set one of Items, Consumable Items, and Exchanged Items to Yes for a type I invoice sort.
- Set Labor or Travel Labor to Yes for a type L invoice sort.
- Set Expense or Travel Expense to Yes for a type E invoice sort.

Items. Yes means this service category is related to items in inventory or the item master. No means the service category is for something that is not an inventory item, such as labor, travel, or some other expense or activity.

Consumable Items. Further qualify items by indicating if they are consumed during the service activity. Examples of consumable items might be oil, replacement fluids, or cleaning fluid. You might consider these items an expense, depending on your own business policies.

Exchanged Items. You can also qualify items as exchanged items. You replace items during service calls and return them, possibly for credit. Toner cartridges are exchanged items.

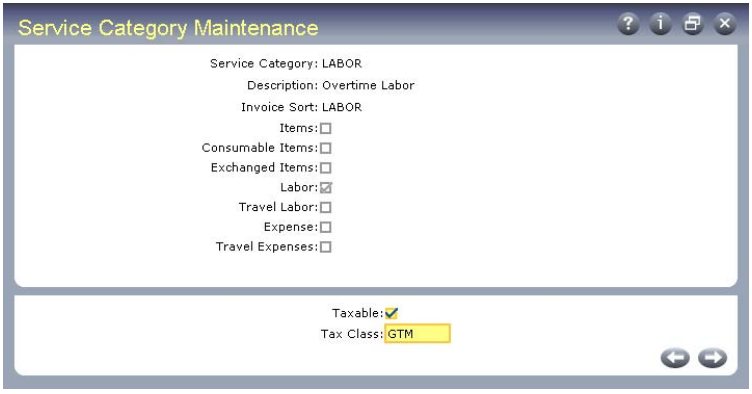
Labor. Yes means this service category is related to work performed by employees.

Travel Labor. Yes means this service category is related to travel time you can charge as labor. Some service organizations charge a service engineer’s travel time as part of labor, while others charge a set rate per mile or field call.

Expenses. Yes means this service category is related to expenses other than labor and consumption of inventory items.

Travel Expenses. Yes means this service category is related to travel expenses, such as food, taxis, air fare.

Fig. 3.5
Service Category Tax Data



Taxable. This field indicates if this service category is usually taxable. When a call line is taxable and not a fixed price repair, this field determines the default in the Taxable field of the billing details in Call Invoice Recording. If the line is not taxable, the system considers the detailed usage records non-taxable.

Tax Class. Enter a tax class previously defined in Tax Class Maintenance (2.13.1.5). The tax class identifies service activities taxed at specific rates or that are tax-exempt. Under Global Tax Management, tax classes help determine the default tax environment (set of tax types).

The value here determines the default tax class for the service category in Call Invoice Recording if the call line is also taxable and not a fixed price repair. If a call line is not taxable, the system sets the taxable status of labor and expenses to No and you cannot modify it.

Default Sites and Locations

Define default sites and locations as part of the setup for Service/Support Management. Sites relate to inventory management and costing, since you set up costs by site.

Functions that access default sites during service activity include:

- Returns and exchanges in Call Activity Recording
- Issues in CAR and Material Order Maintenance
- MO Direct/Pending Returns

Tip
Set up default sites for RMAs in RMA/ RTS Control.

You can set up default sites for combinations of product line, service group, work code, item, and area. Not all combinations are valid. For example, you cannot use product line and item together. Table 3.2 lists the combinations you can define and the order in which the system searches for them. If you enter an invalid combination, a message displays.

The values in the first frame of Default Site Maintenance (11.21.13) are the key for locating site defaults. You can enter any number of specific combinations or create defaults that apply to entire product lines or a particular area. Use different combinations to accommodate different business practices.

Example Your company requires all but two items in product line 200 to be returned to a particular site and location. The two special items require alternate processing, and must be returned to a different location. The search algorithm finds defaults defined for the two special items first, then those set up by product line.

Tip
Area is often a good choice for setting up default sites, since you may want to direct all the engineers within a certain geographic region to send returns to a particular warehouse or repair center.

Service group and product line should not be used together. You may get unpredictable results if you set up default sites for both when some items belong to both groups.

Search Algorithm

Table 3.2 illustrates the search order for default sites and the valid combinations of key fields.

Table 3.2
Search Order for Default Sites

Search Order	Product Line	Service Group	Work Code	Item	Area
1		✓	✓	✓	✓
2				✓	
3	✓	✓	✓		✓
4	✓	✓	✓		
5	✓	✓			

Search Order	Product Line	Service Group	Work Code	Item	Area
6	✓				
7		✓			
8					✓
9					

To minimize the possibility of blank sites defaulting into Call Activity Recording and other functions that use them, the system uses an expanded search. If you defined records with a particular key but not the particular site and location the system needs, the system searches until it finds a record with a non-blank site and location.

Example The system is searching for a default return site in CAR using the call area. A repair site exists for the area, but the return site is blank. The system searches for another record with a value for return site. The next search is with an all blank key. If there is a return site for the all-blank key, the system suggests it.

Valid Combinations

As mentioned previously, numerous functions use default sites. However, not all key values are meaningful in all functions.

Issues in Call Activity Recording

If you have not specified a site and location for the engineer, and the call either does not have an area or the call's area has no site and location, CAR looks for a default spares location for item issues. When searching for a default spares location, the system takes the values for product line, service group, work code, and item from the call line. The system takes the area from the call, which was initially determined by the end user.

Returns in Call Activity Recording

When you return items in CAR, the system derives the values for product line, service group, work code, and item from the item being returned—not the item being repaired. The system still derives the area from the call.

Issues in Material Order Maintenance

The system derives the default site on the header in Material Order Maintenance by searching for a default spares site associated with the call's area if the material order (MO) is associated with a call, or the engineer's area if there is no call.

Returns in MO Direct/Pending Returns

When items on an MO are returned, the system takes search values from the item being returned. However, work code has no value in MO Direct/Pending Returns. The system derives the area from the engineer.

Keep these factors in mind when you set up default sites. If you set up default sites and locations by work code for Call Activity Recording, you may have to set up an alternate set of defaults for MO Direct/Pending Returns. Note, however, if the system does not find return sites in MO Direct/Pending Returns, it returns the item to the issue site and location in Material Order Maintenance.

Location Attributes

You may want a restricted inventory status for return locations. Generally, you inspect returned items before making them available for sales orders or work orders. To allow for this, give the return, scrap, or repair locations a status of not available.

Set the location status to non-nettable to prevent MRP from considering inventory as on-hand. If most of your returns can be put into usable stock with little or no repair, make this inventory location nettable. You usually set scrap and repair locations to non-nettable.

If automatic locations are not enabled for a site, the system verifies that the location exists.

Inventory Transactions

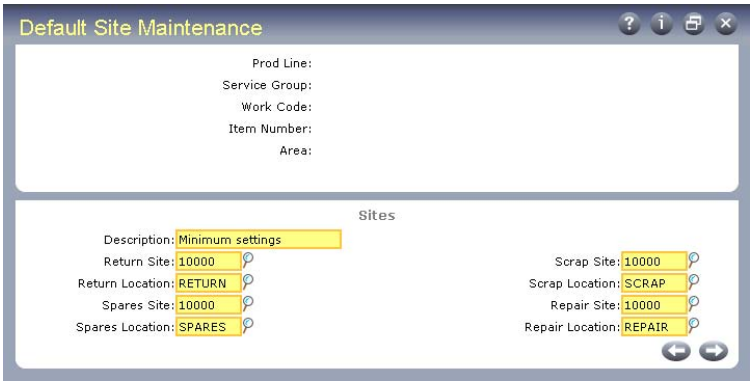
Return locations—return, scrap, and repair—must allow inventory transfers (ISS-TR) and receipts (RCT-TR), as well as unplanned receipts (RCT-UNP).

The spares location must allow inventory transfers and issues to work orders (ISS-WO).

Default Site Maintenance

Use Default Site Maintenance to create and maintain default sites.

Fig. 3.6
Default Site Maintenance (11.21.13)



The product line, service group, work code, item, and area in the first frame are keys for locating site defaults. The system uses defaults when the specified values match. You cannot specify both product line and item at the same time. Table 3.2 lists valid key field combinations.

Description. Enter up to 24 characters describing this set of defaults. This field is for reference only.

Return Site, Location. The system uses this site and location by default for returns under two conditions:

- The item is repairable and Good is Yes in the return status.
- The item is not repairable and Scrap is No.

The return location must allow inventory transfers (ISS-TR) and receipts (RCT-TR), as well as unplanned receipts (RCT-UNP).

Spares Site, Location. The system uses this site and location by default for inventory issues when no other defaults are appropriate. For example, in CAR, if the engineer has no site and location, and the engineer's area has no site and location, the system searches for a default spares site and location. The spares location must allow inventory transfers and issues to work order (ISS-WO).

Scrap Site, Location. The system uses this site and location by default for non-repairable items with a return status that has Scrap set to Yes. The scrap location must allow inventory transfers (ISS-TR) and receipts (RCT-TR), as well as unplanned receipts (RCT-UNP).

Repair Site, Location. The system uses this site and location by default for repairable items with a return status that has Good set to No. The repair location must allow inventory transfers (ISS-TR) and receipts (RCT-TR), as well as unplanned receipts (RCT-UNP).

Tip
Non-repairable items are those for which the Repairable field is No in Service Item Maintenance.

Return Status

Return statuses manage the return and exchange process in Call Activity Recording (CAR) and MO Direct/Pending Returns. They do not apply to RMA receipts. The return status has no formal relationship to statuses defined with Inventory Status Code Maintenance (1.1.1). However, you normally use these two statuses together to control return processing.

See “Location Attributes” on page 97.

Each of the attributes of the return status controls a different aspect of the process:

- Exchange determines if you give credit for an item returned from the customer. You can only exchange items in CAR. Exchange and Pending cannot both be Yes.
- Good and Scrap determine default locations for repairable (Good) and non-repairable (Scrap) items. Good and Scrap cannot both be Yes.
- Pending is for items ordered on an MO and returned in CAR. It determines if the inventory transactions take place in CAR or later in MO Direct/Pending Returns. A pending status requires that Exchange is No, Good is Yes, and Scrap is No.

Standard Returns

Set Pending to No and Exchange to No for a standard return without any billing. For example, an engineer orders five items on an MO for a call and uses only four of them. You load the five items into item usage records in Call Activity Recording. One of them must be returned. CAR can do this directly, or you can use MO Direct/Pending Returns.

The same situation might occur if the engineer ordered too many items on an MO for inventory replenishment. Use MO Direct/Pending Returns to return the items.

Standard returns of items on an MO are executed as inventory transfers (ISS-TR, RCT-TR) from the engineer site and location back to available stock. There is no billing. The system treats returns in CAR that are not exchanges and not on an MO as unplanned receipts (RCT-UNP).

Exchange Returns

Indicate an exchange return by using a return status with Exchange set to Yes. Exchanges typically take place in CAR when an engineer replaces an item during a repair and the returns the old item for customer credit. You can then repair or scrap the returned item.

When you use an exchange return status, the system searches for an exchange price for the returned item on the service price list. Exchange prices use the exchange unit of measure specified in Call Management Control. If the system finds an exchange price, it displays by default during return processing. The system credits the customer this amount when it generates the invoice for the call.

You cannot use this status to return items ordered on an MO, since exchange processing assumes the item is being returned from the customer. Also, you cannot combine Exchange with Pending, since the Pending field is used only with items on an MO. An exchange return executes an unplanned receipt (RCT-UNP).

Pending Returns

You can use pending returns only for items on an MO. For Pending to be Yes, Good must also be Yes, and Scrap must be No. Since you took the items being returned directly out of inventory and did not use them, they should still be good and are returned to a site and location for good stock.

Call Activity Recording uses the pending status to mark items on an MO as returned. During a pending return, the system registers the return against the call and clears allocations for the returned items. However, no inventory is transferred. Complete the return later with MO Direct/ Pending Returns (11.11.8).

Good and Scrap

You can mark items returned as either Good or Scrap. Only one field can be Yes at the same time. The system checks Good when the item's Repairable field is Yes in Service Item Maintenance, Scrap when the item is not repairable. These two fields affect the default sites and locations used during a return:

- If Good is Yes and Scrap is No, the system returns both repairable and non-repairable items by default to the return site and location.
- If Good is No and Scrap is Yes, the system returns repairable items by default to the repair site and location, non-repairable items to the default scrap site and location.

Table 3.3 summarizes the interaction of the Repairable field and the Good and Scrap fields.

Table 3.3 Return Status Fields

Repairable	Return Status	Site
Yes	Good = Yes	Default Return Site
Yes	Good = No	Default Repair Site
No	Scrap = No	Default Return Site
No	Scrap = Yes	Default Scrap Site

You can set up as many return statuses as you need with various combinations of settings. Plan return statuses accurately since inventory processing depends on them.

Default Statuses

You can specify two default return statuses in Call Management Control. These statuses provide defaults during return processing in Call Activity Recording and MO Direct/Pending Returns.

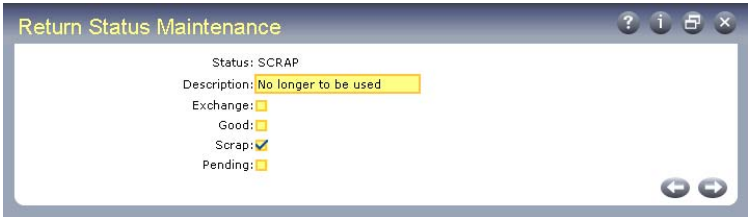
Tip You cannot use a status with Pending set to Yes.

- *Return Status*. CAR uses this status by default for repairable items. It is the default in MO Direct/Pending Returns.
- *Scrap Status.* CAR uses this status by default for non-repairable items.

Return Status Maintenance

Figure 3.7 illustrates Return Status Maintenance.

Fig. 3.7
Return Status Maintenance (11.21.17)



Status. Enter an 8-character code identifying this status.

Description. Enter up to 24 characters describing the code and identifying its use and purpose.

Exchange. Yes indicates an item the customer returned for credit. The system uses the Exchange UM in Call Management Control to find an exchange price on the call price list. The system credits the customer who returned the item this amount and receives it into inventory using an unplanned receipt transaction.

Good. The system checks this field only if the item is repairable. Good can be Yes only if Scrap is No. If Yes, the system suggests the default return location; if No, the default repair location.

Scrap. The system checks this field only if the item is not repairable. Scrap can be Yes only if Good is No. If Yes, the system suggests the default scrap location; if No, the default return location.

Pending. Set this field to Yes to mark pending returns in Call Activity Recording for items ordered on an MO. Complete the return later with MO Direct/Pending Returns. If Pending is Yes, Good must also be Yes, Scrap must be No, and Exchange must be No.

Charge and Revenue Management

The charge code determines who pays for service costs and which GL accounts are affected. The connection to accounts is made through product lines.

Service/Support Management provides two maintenance functions for specifying the product lines that segregate service costs and revenue from regular sales and COGS accounts:

- Charge Product Line Maintenance (11.21.21.5)
- Revenue Product Line Maintenance (11.21.21.9)

These functions control which accounts the system uses and when, in a range from straightforward to complex. You can base charge and revenue product lines on a number of selection criteria, further increasing your financial management control.

See “Detailed Accounting in CIR” on page 543 for details on how Call Activity Recording and Call Invoice Recording use product lines.

Charge Codes

Charge codes play an important role in managing the financial impact of service activity. The charge code determines who pays for service costs, depending on which fields are Yes.

A charge code has one of seven possible attributes. Each attribute has a particular effect. Charge codes determine whether the system:

- Invoices service to the customer—billable and fixed billable
- Provides it free of charge—warranty, contract, covered, or giveaway
- Tracks it internally against a special project—project mandatory

Normally, you should create at least one charge code for each attribute to cover all possible business applications. However, if you do not use fixed pricing or track service costs for internal projects, these charge codes may not be needed.

Important After you define charge codes, be careful about changing them. If you change a charge code marked Billable, for example, to Project Mandatory, it is no longer valid for contract limit records, as a billable default, and may be invalid in Call Activity Recording. You will now generate errors if you access records using the charge code.

Application of Charge Codes

Charge codes affect numerous functions:

- *Service Limits*. You can associate under- and over-limit charge codes with the various limits for a service type or contract. When this service type or contract provides coverage in CAR, the system uses the charge codes from the limits first. If you have not associated charge codes with limits, you can define default charge codes in Default Charge Code Maintenance.
- *Recording Service*. CAR suggests a charge code for each line of detail recorded, providing you maximum flexibility to manage financial impacts.
- *Service Invoicing.* When CAR summarizes service costs, the seven rows represent the seven types of charge codes.
- *Product Lines and Accounts*. Charge codes can be associated with a product line in Charge Product Line Maintenance. You can segregate the cost of different kinds of service activity by connecting the various charge codes with different product lines. For example, you can direct the cost of warranty service to different accounts than the cost of contract service. Charge codes can be used in this way in Call Activity Recording and for expensed material orders.

Charge Code Maintenance

Use Charge Code Maintenance (11.21.21.1) to create and maintain charge codes. Figure 3.8 shows a charge code for service provided under contract.

Fig. 3.8 Charge Code Maintenance (11.21.21.1)

Charge Code. Enter a code identifying a charge code.

Description. Enter up to 24 characters describing the code and identifying its use and purpose.

Note Only one of the remaining choices in Charge Code Maintenance can be Yes. This setting determines the effect of the charge code.

Warranty. Yes means the original warranty covers the charges. If Warranty is Yes, the charge can be the under-limit charge code on a warranty type. It can also be the default warranty charge code in Default Charge Code Maintenance.

When the system uses this charge code, it examines the limits on the warranty type and uses the level of coverage to determine how much to invoice the customer. The system does not use limit amounts with warranties—just the percent of coverage. Service charges are accumulated only against contracts and contract line items.

Contract. Yes means an existing, valid contract covers the charges. You can specify a charge code with Contract set to Yes as the under-limit charge code on a contract or contract type. It can also be the default contract charge code in Default Charge Code Maintenance.

When the system uses this charge code, it examines the limits on the contract and uses the limits and level of coverage to determine how much to invoice the customer. The system uses the limits on the contract line, then the contract header, and finally the contract service type.

Covered. Yes means either a generic service type or the default call service type in Call Management Control covers the charges. You can specify a charge code with Covered set to Yes as the under-limit charge code on warranty or contract types. It can also be the default covered charge code in Default Charge Code Maintenance.

Important Use this kind of charge code carefully, and only on service types that provide coverage apart from specific contracts or warranties. *Never* use it on service types that are the basis of contracts or warranties.

Normally, you use Covered only for the Call Default Service Type in Call Management Control. If you have alternate generic service types, you can also use Covered for them. A warning displays in Contract and Warranty Type Maintenance when you specify a covered charge

code. A Covered charge code on a service type used as a warranty or as a basis for contracts can create confusion in Call Activity Recording.

When the Covered charge code is an override in Call Activity Recording, the system applies the levels of the default call service type. If, for example, you normally provide some level of coverage as a goodwill gesture, override a Billable charge code with Covered to provide that level of coverage for an item in Call Activity Recording.

The system uses the coverage levels of the default service type but not any limit amounts. Service charges are accumulated only against contracts and contract line items.

Tip
Set up projects in Project Code Maintenance (25.3.11).

Project Mandatory. Yes means you are using this charge code to track internal charges related to a particular company project. You cannot use this charge code unless you specify a project in CAR. You cannot use a charge code with Project Mandatory set to Yes as an under- or over-limit charge code on warranty types, contract types, or contracts. You can only use it as an override in CAR.

Tip
Use fixed pricing as an alternative to contract and warranty coverage.

Fixed Price Billable. Yes means you are using this charge code to track fixed-price service. The system suggests a fixed-price billable charge code in CAR when you use a fixed price work code. The system invoices the customer the fixed price regardless of the actual cost of service. Fixed-price service is an alternative to service based on contracts and warranties. When you use the fixed price, no limits are examined.

When Fixed Price Billable is Yes on a charge code, you cannot use it as an under- or over-limit charge code on warranty types, contract types, or contracts, since you do not use fixed pricing in conjunction with service coverage. However, you can specify it as the default fixed-price billable charge code in Default Charge Code Maintenance.

Billable. Yes means the system invoices the charges to the customer. You can specify a charge code with Billable set to Yes as the over-limit charge code on a contract or service type. You can also specify it as the default billable charge code in Default Charge Code Maintenance. Once service limits are exceeded, the system suggests the over-limit charge code. When you use a Billable charge code in Call Activity Recording, the covered amount is always zero.

Giveaway. Yes means the customer receives the service without any charge, and the system does not accumulate costs against any service limits in effect. You cannot use a charge code with Giveaway set to Yes as an under- or over-limit charge code on warranty types, contract types, or contracts. You can only specify it as an override in Call Activity Recording.

Charge Product Lines

Every item must be associated with a product line when you define it in the item master. The product line determines the general ledger accounts for financial transactions. You can further break down GL accounts by using Sales Account Maintenance or Inventory Account Maintenance. However, the service environment has special accounting needs.

Many service organizations do not want service costs and revenues included with manufacturing costs and item sales revenue. They need detailed reports that show the costs incurred by service under various conditions.

To address these accounting needs, define charge and revenue product lines to direct costs and revenue to accounts based on service-related factors.

Use Charge Product Line Maintenance (11.21.21.5) to set up product lines for service costs. Charge product lines can direct costs to different accounts depending on the charge code, the service type you associate with the call, the service category or work code of the usage detail, or the product line or service group of the item being repaired.

In the absence of charge product lines, the system uses a standard algorithm to determine the relevant product line, based on Use Item Prod Line in Service Management Control. If this is Yes, the system uses the product line of the item being repaired; if No, the product line of the service type associated with the item being repaired. In either case, if a product line is still not found, the default accounts in System/Account Control are used.

Important Since accounting is such an important part of a business endeavor, carefully plan how you use product line accounts in service.

Simple or Complex

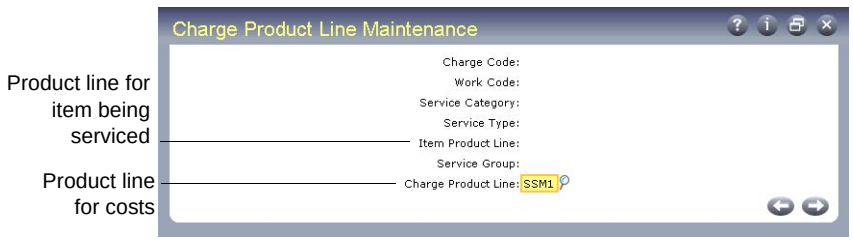
Your setup of charge product lines can be relatively simple or complex, depending on how you apply your business practices. You can direct service costs to one product line. Or, at the most complex, you can use all fields, including charge code, work code, service category, service type, item product line, and service group.

Most companies find a policy between the two extremes best meets their needs. For example, relating product lines to charge codes is one effective way to distinguish and report on costs.

The system searches key fields for charge product lines from the bottom up, and you must fill them without skipping any. For example, if you want to use service category as part of the search algorithm, you must also specify work code and charge code.

Example The following example shows how to break out service costs from the standard sales and COGS accounts. You do this by leaving all fields blank except Charge Product Line. Figure 3.9 shows the entire setup.

Fig. 3.9 Charging All Service Costs to One Charge Product Line



Leaving the other fields blank means that the system charges service costs to the accounts in product line SSM1, regardless of the charge code, work code, service category, service type, item product line, or service group.

Example You can also break out service costs related to particular charge codes, as Figure 3.10 shows.

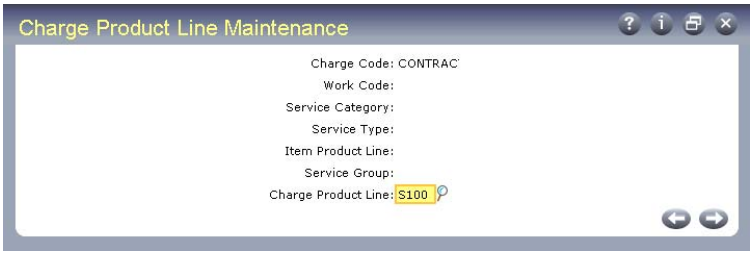


Fig. 3.10
Breaking out Service Costs for a Charge Code

In this example, all costs for service contract activities are charged to service product line S100. Use this kind of setup to see how costs are distributed between contract, warranty, and billable service.

Charge Product Line Maintenance Fields

When Call Activity Recording searches for a charge product line, it derives the values for charge code, work code, service category, and service type from each line of detail. It derives the value for item product line and service group from the item for which you are providing service.

Charge Code. Enter a valid charge code defined in Charge Code Maintenance. This field can be blank, but if so, all remaining key fields must also be blank. If you enter a value here, the system uses the associated charge product line for the cost of details recorded in CAR only when this charge code is on the line of detail.

Work Code. Enter a work code defined in Work Code Maintenance. This field can be blank, but if so, all remaining key fields must also be blank. If you enter a value here, the system uses the associated charge product line for the cost of details recorded in CAR only when this work code is on the line of detail.

Service Category. Enter a service category defined in Service Category Maintenance. This field can be blank, but if so, all remaining key fields must also be blank. If you enter a value here, the system uses the associated charge product line for the cost of details recorded in CAR only when this service category is on the line of detail.

Service Type. Enter a service type defined in Contract or Warranty Type Maintenance. This field can be blank, but if so, all remaining key fields must also be blank. If you enter a value here, the system uses the associated charge product line for the cost of details recorded in CAR only when this service type is in effect for the line of detail.

Tip
This is the product line of the item being repaired, not the item issued as part of the repair.

Item Product Line. Enter a product line defined in Product Line Maintenance. This field can be blank, but if so, Service Group must also be blank. If you enter a value here, the system uses the associated charge product line for the cost of details recorded in CAR only when you repair items belonging to this product line.

Tip
This is the service group of the item being repaired, not the item issued as part of the repair.

Service Group. Validated against codes you set up in Generalized Codes Maintenance for field pt_svc_group. However, this field can be blank even if a blank generalized code does not exist. If you enter an invalid value, a warning displays. The system does not use the data you are about to create unless you set up this value in Generalized Codes Maintenance.

If you enter a value here, the system uses an associated charge product line for the cost of details recorded in CAR only when you repair items belonging to this service group.

Charge Product Line. Enter a product line defined in Product Line Maintenance. The system uses the accounts associated with this product line for the cost of details recorded in CAR when the other key fields match.

Revenue Product Lines

Revenue product lines are similar to charge product lines. However, in the case of revenue product lines, the financial impact represents the income from service activity, rather than the cost.

Another important difference is that the system applies charge product lines to the usage detail consumed in Call Activity Recording. Revenue product lines, however, are applied at a higher level to the item being A different charge product line can be specified for each item consumed, each expense, and each hour of labor. Revenue product lines track income from the service activity only for the item repaired.

Like charge product lines, you can base revenue product lines on several criteria. Criteria for revenue product lines are limited, however, to the service type and work code associated with the call line, or the product line and service group of the item being repaired. The charge code and service category do not apply.

Table 3.4 summarizes the differences between charge and revenue product lines.

Table 3.4 Product Line Comparison

	Charge Product Line	Revenue Product Line
Used For	The costs of service activity	The income from service activity
Applies To	Detail usage records	Call line items
Key Includes	Charge Code, Work Code, Service Category, Service Type, Item Product Line, Service Group	Work Code, Service Type, Item Product Line, Service Group
Displays In	Call Activity Recording	Call Invoice Recording

If you have no revenue product lines, the value of Use Item Prod Line in Service Management Control determines the default suggested in Call Invoice Recording. If Yes, the product line of the item being repaired displays as a default. If No, the product line of the service type in effect displays.

The setup of revenue product lines, like charge product lines, can be relatively simple or complex, depending on your business practices.

Revenue Product Line Maintenance

Use Revenue Product Line Maintenance (11.21.21.9) to create and update revenue product lines.

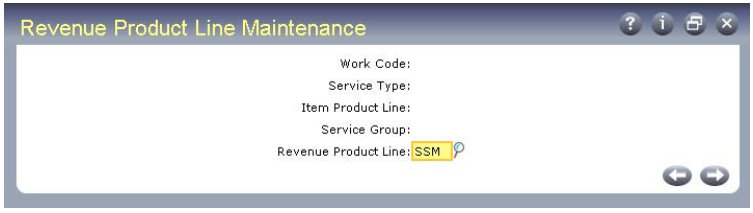


Fig. 3.11 Revenue Product Line Maintenance (11.21.21.9)

When Call Invoice Recording searches for a revenue product line, the system derives the value for work code and service type from the call line. It derives item product line and service group from the item you are servicing.

Work Code. Enter a work code defined in Work Code Maintenance. This field can be blank, but if so, all remaining key fields must also be blank. If you enter a value here, the system uses the associated revenue product line for the revenue received for the repair of an item only when the item being repaired has this work code.

Service Type. Enter a service type defined in Contract or Warranty Type Maintenance. This field can be blank, but if so, all remaining key fields must also be blank. If you enter a value here, the system uses the associated revenue product line for the revenue received for the repair of an item only when the item being repaired has this service type.

Item Product Line. Enter a product line defined in Product Line Maintenance. This field can be blank, but if so, Service Group must also be blank. If you enter a value here, the system uses the associated revenue product line for the revenue received for service recorded in CAR only when you repair items belonging to this product line.

Service Group. This field is validated against codes defined in Generalized Codes Maintenance for field pt_svc_group. However, this field can be blank even if a blank generalized code does not exist. If you specify an invalid value, a warning displays. The system does not use the data you are about to create unless you set up this value in Generalized Codes Maintenance.

If you enter a value here, the system uses the associated revenue product line for the revenue received for service recorded in CAR only when you repair items belonging to this service group.

Revenue Product Line. Enter a product line defined in Product Line Maintenance. The system uses the accounts associated with this product line for the income generated by Call Invoice Recording when the other key fields match.

Search Order for Product Line

The system searches key fields for charge and revenue product lines from the bottom up. You must fill them in without skipping any. For example, to use service category as part of the search algorithm for a charge product line, you must also specify a work code and charge code.

If you use a large number of key field combinations to define product lines, the searches for determining the correct product line for a particular operation can be quite complex. Consider this when you set up the product lines, since increasing complexity has a performance cost, and may be difficult to understand and manage.

When the system searches for a product line to use, it proceeds from the most specific to the most generic as follows:

Tip
Revenue product lines do not use charge code and service category.

1. Search for an exact match with charge code, work code, service category, service type, item product line, service group.
2. Blank out service group and search again.
3. Blank out service group and item product line and search again.
4. Blank out service group, item product line, and service type and search again.
5. Blank out service group, item product line, service type, and service category and search again.
6. Blank out service group, item product line, service type, service category, and work code and search again.
7. Blank out all fields including charge code and search for a product line based on the product line type: revenue or charge.

If a charge or revenue product line is not found, the system uses the product line of the item or the service type in effect, depending on Use Item Prod Line in Service Management Control. If this is Yes, the system uses the product line associated with the item being serviced; if No, the product line associated with the contract or warranty in effect, or the default service type.

The last option is the default accounts in System/Account Control (36.1).

Default Charge Codes

You can specify charge codes while you record activity in Call Activity Recording. However, to streamline recording, the system always attempts to suggest the most appropriate charge code.

When you define warranty and service types, you can specify a default under- and over-limit charge code. The system looks for these first. If you do not use these, you can set up default charge codes in Default Charge Code Maintenance (11.21.21.13). If no defaults exist, users recording activity must supply them manually in CAR.

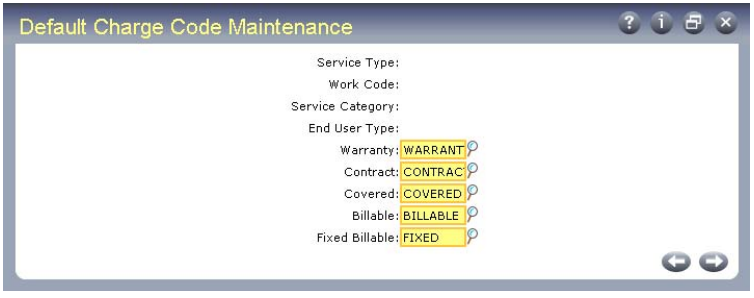
The defaults defined with Default Charge Code Maintenance are useful for service environments with a minimum of service level combinations. A simple service environment can use a few sets of default codes for everything. For more detailed control, specify under- and over-limit charge codes on your service types.

Default Charge Code Maintenance

You can define five default charge codes for any combination of service type, work code, service category, and end-user type. These four fields are the key used by the system when it searches for an appropriate default. If it does not find an exact match, it searches for less specific matches.

Leave the key fields blank to create a generic set of default charge codes the system can apply in all cases.

Fig. 3.12
Default Charge Code Maintenance (11.21.21.13)



Service Type. Enter a service type defined in Contract or Warranty Type Maintenance. This field can be blank. If you enter a value here, CAR suggests the associated default charge codes only when this service type is in effect for the line of detail.

Work Code. Enter a work code defined in Work Code Maintenance. This field can be blank. If you enter a value here, CAR suggests the associated charge codes only when this work code is on the line of detail.

Service Category. Enter a service category defined in Service Category Maintenance. This field can be blank. If you enter a value here, CAR suggests the associated charge codes only when this service category is on the line of detail.

End User Type. This field is normally validated against values in Generalized Codes Maintenance for field eu_type. However, it can be blank even if a blank value is not defined. If you specify an invalid value, a warning displays. The data you are setting up has no application in the system unless you create this code later.

If you enter a value here, CAR suggests the associated charge codes only when the type of the end user initiating the call matches.

Warranty. Enter a charge code defined in Charge Code Maintenance with Warranty set to Yes. CAR suggests the warranty charge code only if a warranty type is providing coverage.

Contract. Enter a charge code defined in Charge Code Maintenance with Contract set to Yes. CAR suggests the contract charge code only if a contract is providing coverage.

Covered. Enter a charge code defined in Charge Code Maintenance with Covered set to Yes. CAR suggests the covered charge code only if coverage for the call line is being provided by the default call service type or some other service type you enter.

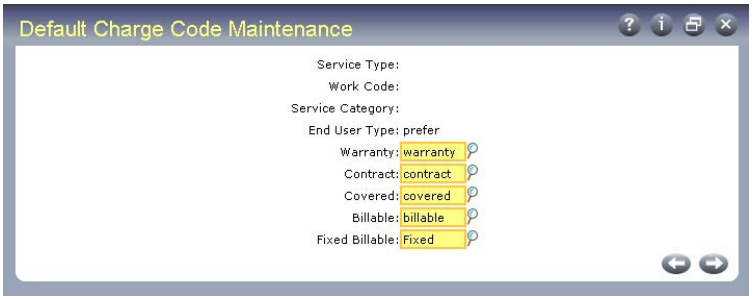
Billable. Enter a charge code defined in Charge Code Maintenance with Billable set to Yes. CAR suggests the billable charge code when no coverage is provided by the current service type or service has consumed the limits on a contract.

Fixed Billable. Enter a charge code defined in Charge Code Maintenance with Fixed Price Billable set to Yes. CAR suggests the fixed billable charge code whenever you use a fixed price work code.

Example Default Charge Code Setup

You can create a set of default charge codes for a special kind of end users using the End User Type field. In the example in Figure 3.13, the system suggests this charge code regardless of the service type, work code, or service category.

Fig. 3.13
Sample Default Charge Code for Preferred Customer



Search Order

During processing in CAR, the system looks for default charge codes with any combination of values in the key, in the sequence listed in Table 3.5.

Table 3.5
Search Order for Default Charge Codes

Search Order	Service Type	Work Code	Service Category	End User Type
1	✓	✓	✓	✓
2	✓	✓	✓	
3	✓	✓		✓
4	✓		✓	✓
5		✓	✓	✓
6	✓	✓		
7	✓		✓	
8	✓			✓
9		✓	✓	
10		✓		✓
11			✓	✓
12	✓			
13		✓		
14			✓	

Search Order	Service Type	Work Code	Service Category	End User Type
15				✓
16				

User Preferences

SSM offers a number of ways to streamline data entry when you take a call by predefining default field values. You specify some of the values in control programs. These settings determine defaults for all users. You can also set up call defaults using Call Default Maintenance based on work code, model, and service group.

However, in some cases, each user may want to determine a default value used when they execute a program. Use Service/Support User Preferences (11.21.23) to enter values for individual users. Users must have been previously defined in User Maintenance (36.3.18).

See Table 11.3, “Call Default Precedence Rules,” on page 362 for details on how default settings are used.

Note For more control, apply system security so only managers can set up user preferences.

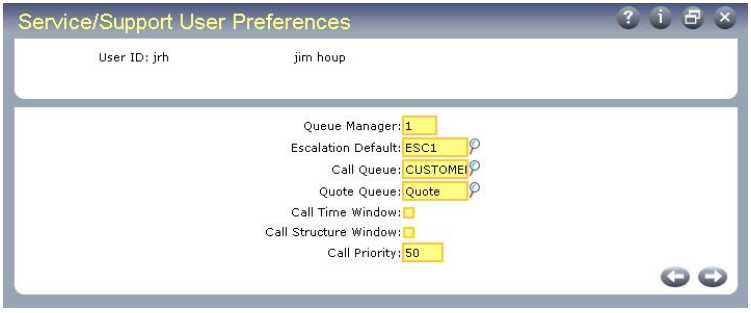


Fig. 3.14 Service/Support User Preferences (11.21.23)

User ID. Enter a user ID defined in User Maintenance (36.3.18). You do not have to be logged in as the user; managers can set appropriate defaults and restrict users from changing them.

Queue Manager (0, 1, 2, 3). Controls the sort criteria for calls displayed in the Call Queue Manager (11.1.6) and overrides the value in Call Management Control.

0 (zero): Displays calls by next date and next time. Pivot sorts by end user.

1: Groups calls by the Assigned (engineer) field, then response priority. Pivot sorts by Queue.

2: Sorts by the Assigned (engineer) field. Pivot sorts by end user.

3: Sorts by the Area field. Pivot sorts by customer.

Tip
Use Escalation Maintenance (11.1.13.1) to set up escalation codes.

Escalation Default. Enter the default escalation code for Call Maintenance (11.1.1.1). Leave this field blank if you do not use call escalation. When this user creates a call, this setting overrides the default in Escalation Control. However, if the end user has an escalation or one is defined in Call Default Maintenance, it is used first.

Tip
Use Call Queue Maintenance (11.1.21.7) to set up call queues.

Call Queue. Enter a code used to group service calls for dispatching and review with the Queue Manager. When this user creates a call, this setting overrides the default set in Call Management Control. A queue set by an escalation or in Call Default maintenance takes precedence over this value.

Quote Queue. Enter a code used to group call quotes. When this user creates a quote, this setting overrides the default in Call Management Control. A queue set in Call Default Maintenance takes precedence.

Call Time Window. Specifies whether the Travel and Estimated Time window appears in Call Maintenance. Enter Yes to record the estimated call length, travel distance, and travel time in Call Maintenance (11.1.1.1). When this user creates a call, this setting overrides the default in Call Management Control.

Call Structure Window. Specifies whether the Repair Structure Detail window appears in Call Maintenance. If Yes, a frame displays in Call Maintenance (11.1.1.1) where you can specify or modify the service BOM and routing. When this user creates a call, this setting overrides the default in Call Management Control.

Call Priority. Enter a number indicating how important this call is. Lower numbers indicate higher priority. In order of precedence, the value in the Priority field defaults from:

- The Call Priority field in End User Address Maintenance.

- If this field is zero, then depending on whether the item is covered under a warranty or service contract, the default comes from the Priority field in either Warranty Type Maintenance or Contract Type Maintenance.
- If the item is not covered under warranty or contract, the default is the priority of the Default Call Service Type in Contract Control.
- The system uses user preferences if none of the above apply.

Generalized Codes for Service

QAD 2007 uses generalized codes, which you define in Generalized Codes Maintenance (36.2.13), extensively. They give you flexibility in organizing and implementing functions, since you can define values that are meaningful in your own business environment.

In the Service/Support Management module, you can define generalized codes to shape how you record and manage service activity information. Table 3.6 lists most of the codes referenced by service functions. Use it to plan which codes to use in your implementation.

Table 3.6 Generalized Codes for Service

Code	Label	Where Used
ad_state	State	End User frame of Call Maintenance
ca_resolve	Resolution	Call Update frame of Call Maintenance (ca_resolve)
ca_severity	Severity	Call Maintenance (ca_severity) Call Default Maintenance (cdf_ca_severity) Call Escalation Maintenance (es_ca_severity)
ccd_cause	Cause	Fault Codes (ccd_cause)
ccd_problem	Problem	Fault Codes (ccd_problem)
ccd_resolution	Resolution	Fault Codes (ccd_resolution)
egd_sched_type	Schedule Type	Engineer Detail Schedule Maint (egd_sched_type)
eng_location	Current Location	Engineer Maintenance (eng_location)
esh_sched_type	Schedule Type	Engineer Master Schedule Maintenance (esh_sched_type)

Table 3.6 — *Generalized Codes for Service* — (Page 1 of 4)

Code	Label	Where Used
eu_type	End User Type	End User Address Maintenance (eu_type) Default Charge Code Maintenance (fcd_eu_type) Warranty Code Maintenance (svtype)
eud_title	Title	End User Address Maintenance (eud_title)
eud_type	Contact Type	End User Address Maintenance (eud_type)
fsgroup	Engineer Group Group Engineer Group	Engineer Maintenance (eng_group) Escalation Maintenance (es_group) End User Maintenance (eu_eng_group)
fsskill	Prob/Skill	Call Maintenance (ca_problem) Call Default Maintenance (cdf_ca_problem) Engineer Skills Table (fsskill) Call Escalation Maintenance (es_ca_problem)
isb_owner	Ownership	Installed Base Item Maintenance (isb_owner)
isb_status	Status	Installed Base Item Maintenance (isb_status)
pgh_status	Status	Status (pgh_status) Waiting for Page Status (pgc_wait_status) in Paging Control Paged Status (pgc_paged_status) in Paging Control
pod_um	Unit of Measure	RTS Maintenance (pod_um)
pt_model	Model	Service Item Maintenance (pt_model) Call Default Maintenance (cdf_model) Call Maintenance (part-model)
pt_svc_group	Service Group	Service Item Maintenance (pt_svc_group) Default Site Maintenance (rdf_svc_group) Charge Product Line Maintenance (fcc_pt_svc_group) Revenue Product Line Maintenance (fcc_pt_svc_group) Call Default Maintenance (cdf_group) Call Maintenance (part-svc-group) Price List Maintenance (fpc_svc_group)
pt_svc_type	Usage Code	Service Item Maintenance (pt_svc_type)

Table 3.6 — *Generalized Codes for Service* — (Page 2 of 4)

Code	Label	Where Used
pt_sys_type	System Type	Service Management Control (svc_sys_type) Service Item Maintenance (pt_sys_type) Installed Base Item Maintenance (isb_sys_type)
pt_um	Unit of Measure Exchange UM Fixed UM	Price List Maintenance (fpc_um) Call Management Control (svc_exch_um) Call Management Control (svc_fixed_um)
reg_type	Area Type	Area Maintenance (reg_type)
rmd_fault_cd	Fault Code	RMA Maintenance (rmd_fault_cd)
ro_tool	Tool Code	Service Routing Maintenance (ro_tool) Service Standard Operation Maint (opm_tool)
sa_sa_type	Type	Contract Maintenance, Contract Quote Maintenance
sa_stat	Action Status	Contract Maintenance (sa_stat)
sad_type	Ship Type	Contract Maintenance (sod_type)
sap_bom_type	BOM Type	Contract Maintenance, PM Scheduling
so_channel	Channel	RMA Maintenance (so_channel) Call Activity Recording (ca_channel) Call Invoice Recording (ca_channel) Contract Maintenance (sa_channel)
so_cr_card	Credit Card	Contract Maintenance (sa_cr_card) RMA Maintenance (so_cr_card)
so_cr_init	CR Initials	Contract Maintenance (sa_cr_init) RMA Maintenance (so_cr_init)
so_fob	FOB Point	RMA Maintenance (so_fob)
so_shipvia	Ship Via	RMA Maintenance (so_shipvia) MO Maintenance (so_shipvia)
so_stat	Action Status	RMA Maintenance (so_stat) MO Maintenance (so_stat)
sod_type	Type	RMA Maintenance (sod_type)
sod_um	UM	RMA Maintenance (sod_um)
srr_problem	SR Problem	SR Maintenance (srr_problem)

Table 3.6 — *Generalized Codes for Service* — (Page 3 of 4)

Code	Label	Where Used
srr_severity	SR Severity	SR Maintenance (srr_severity)
srr_type	SR Type	SR Maintenance (srr_type)

Table 3.6 — *Generalized Codes for Service* — (Page 4 of 4)

Chapter 4

Multiple Time Zones

This chapter describes SSM's optional Multiple Time Zones (MTZ) feature. First, a general business background and overview of MTZ is presented, then the details of activating and setting up. The next section describes the impact of MTZ on service processing, including call management, the installed base, service contracts, and engineer scheduling. Finally, additional technical reference material is provided.

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Business Considerations

It is increasingly common for service organizations to support customers across a wide geographic range. Being a global service provider presents special challenges and requirements such as multiple currencies, different tax structures, and multiple languages.

A special global business challenge for service providers, however, is accommodating variations in local time.

An awareness of time zones is uniquely important to service organizations because service coverage and associated fees are often dependent on the date and time a client requests and you supply coverage. Also, service contracts can include an obligation to respond to customer issues within a certain number of hours.

Sample Scenario

Consider this illustration of the importance and potential complexity that time zones introduce into service requirements.

A software support organization has a central service center in Denver. A customer in New Jersey contacts the center in Denver at 8:00 on Monday morning with a critical problem. In Denver, the local time is 6:00 AM.

Figure 4.1 illustrates the locations in this scenario.

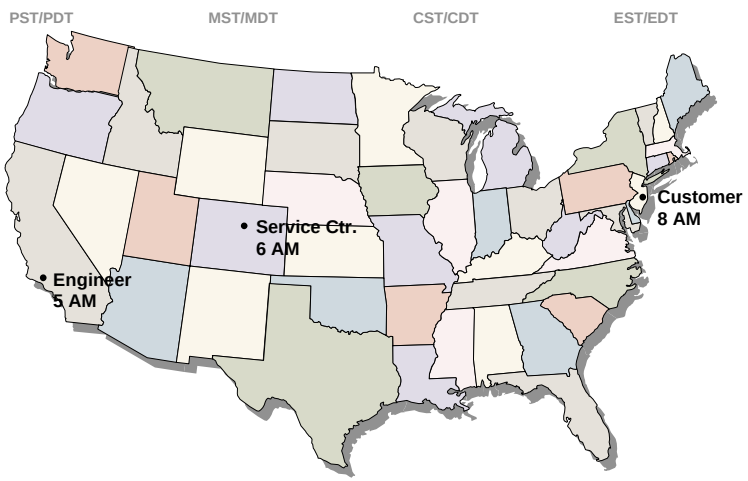


Fig. 4.1
Managing Multiple Time Zones

This customer's service contract specifies full coverage during normal business hours, defined as 8:00-17:00, Monday through Friday. At other times, the customer pays 50% of the service charges. The contract also specifies that a customer request receives a response within two hours.

So a service call at 8:00 AM (customer time) is fully covered. For the system to find the correct coverage, the time used must be the end user's.

Based on the response time stipulated in the contract, an engineer should contact the end user by 10:00 AM Monday, New Jersey time. The service center dispatcher assigns the call to an engineer in California, where the time of the call is 5:00 AM Monday. When the engineer reviews the call, he needs to know that he must respond by 7:00 AM his time to meet the contractual obligation.

This is a simple example. In some cases, the system registers date differences as well as time differences.

MTZ Features

The multiple time zone (MTZ) option of Service/Support Management helps you create, display, and track calls that accommodate and adjust for time differences. The main features of MTZ include:

- Support for defining and maintaining time zones, including the changes required by daylight savings time
- Association of time zones with customers, end users, and engineers
- Call creation and scheduling from the end user's point of view
- Storage of installed base data relative to the end user's time zone
- Coverage checking based on the end user's time zone
- Flexible display of time-sensitive data from multiple points of view
- Enhanced engineer scheduling options for engineer call assignment

Note Time zone maintenance programs and reports are also available on the Database Management (36.16) menu in Manager Functions. The programs are exactly the same as the ones in SSM. Time zones must be associated with each user when they are defined in User Maintenance (36.3.18).

A default server time zone can be defined and updated in System/Account Control (36.1), unless MTZ is activate in SSM. In this case, the server time zone is controlled by SSM functions.

Overview of MTZ

The Service/Support Management module provides many time-sensitive features. For example, you can define a duration and a number of hours per day for service coverage. The response time and coverage hours you associate with a service type determines when engineers should act on a call. Engineer scheduling uses these dates and times to assign an engineer to respond to the request.

Activating MTZ and converting existing data is described fully in “Activating MTZ” on page 127.

When service providers and end users are located in different time zones, understanding these dates and times can become extremely complex. Using MTZ provides an integrated solution for organizations facing these issues. Since not all users of SSM manage calls across multiple time zones, MTZ is optional. As a result, most of MTZ’s data elements are not visible unless it is active.

When MTZ is not active, SSM uses the system date and time provided by the database server machine as the default value in date and time fields. MTZ also uses this date and time for storing most date and time information internally. However, before display, it converts times that are relative to an end user. To allow for conversion, you must set up and define the server time zone explicitly. Since more than one database can reside on a common server, you can also set the database time zone.

Figure 4.2 illustrates three fields in Service Management Control that display values associated with MTZ. You cannot, however, always update these values directly in the control program.

Fig. 4.2 Service Management Control (11.24)

Multiple Time Zones indicates whether MTZ is active. You can update it in the control program when its value is Yes. Use the Multiple Time Zones Startup Utility (11.21.22.24) to activate MTZ.

See “Multiple Time Zones Startup Utility” on page 130.

Server Time Zone is display only. Either the startup utility or the Server Time Zone Change Utility (11.21.22.22) sets this time zone. These utilities adjust the internally stored records to conform to the new time zone.

Database Time Zone distinguishes between the time zone for a database and the server time zone. This is useful when users in different time zones access several databases that run on one server. This field has no effect on the way the system stores dates and times. However, most call reports and inquiries can display dates and times relative to the database time.

Activating MTZ

As explained in the overview, MTZ changes the way the system stores and displays dates and times. Switching MTZ on and off is not recommended. Carefully consider your business needs before activating MTZ.

Activating MTZ in a New Database

Typically time zone data is loaded during the installation process. Since a time zone must be associated with each user, this data is loaded or created by the system administrator using functions on the Multiple Time Zones menu (36.16.22) in the Manger Functions module. Loading time zone data is accomplished with Multiple Time Zone Load Utility (36.16.22.13).

Even if you have completed this general setup, you must still execute the Multiple Time Zones Startup Utility (11.21.22.24) to activate multiple time zone features. If you have already loaded time zone data, you can set these fields to No in the utility.

See page 130 for details.

Activating MTZ in an Existing Database

If your business requirements change or you are upgrading to a new release of QAD 2007 that now supports MTZ, you can still activate MTZ. Additional conversion and setup properly initializes existing records.

1. Make a backup of the database to be converted.

See page 138 for details.

2. Define your own time zones with Multiple Time Zones Maintenance (11.21.22.1) or load default time zone data as part of the next step. Skip this step if it was done by the system administrator when users were defined.

3. If you are activating MTZ as part of an upgrade from an earlier release, make sure you have executed the J1B6 Utility (11.25.16). Also, if you have never run the Initialize Engineer Address utility (11.13.25), the startup utility may display errors regarding missing address records. Execute 11.13.25 so each engineer record has a corresponding address record.

See page 130 for details.

4. Execute the Multiple Time Zones Startup Utility (11.21.22.24) to activate MTZ and set the server time zone.

   In a database with existing records, the startup utility performs the conversions MTZ requires by:

   - Initializing all customer, end user, and engineer address records so their associated time zones are the server time zone.
   - Initializing two fields for each call record that define the date and time of the call in the end user's time zone.

See page 133 for details.

5. Execute the End User Time Zone Change Utility (11.21.22.20). In step 4, you initialized the end users to the server time zone. You can reset the time zone for groups of end users selected by state, postal code, or country. This utility also updates the end user's active calls by setting the end user open date and time appropriately.

   To minimize the impact of time zone conversion, you can gradually convert end users.

Implementation Notes

This section highlights some details to consider when you activate multiple time zones in an existing QAD 2007 database.

Custom Reports

After activating MTZ, you may need to adjust custom reports that access dates and times. For example, if you manually adjusted call open times for time zone differences, these times are now in the server time zone and must be converted before they are displayed. If your reports continue to display the date and time as stored, they do not reflect the time zone you expect.

A set of tables beginning on page 158 lists how the system stores data in call-related date and time fields.

CIM Loading Data

If you use the CIM interface to load data into calls or other tables affected by MTZ, you may need to modify them to accommodate time zone fields.

Call History

When you activate MTZ, dates and times on open calls are initialized to the server time zone. However, the calls in the history table are not converted. After MTZ is activated, time data in these calls displays without conversion, regardless of which display time zone you specify.

When you move calls to history after MTZ is active, the system stores the server time zone and end-user time zone values with the call. When you generate reports for these calls, the system converts the time data to the display time zone based on these values.

If you change your server time zone or end-user time zone, the call history table is not affected. It retains the values for the call at the time you moved it to history.

MTZ Functions

The following menu-level programs support Multiple Time Zones. You use them during implementation and later for time zone maintenance.

- Multiple Time Zones Maintenance (11.21.22.1)
- Multiple Time Zones Inquiry (11.21.22.2)
- Multiple Time Zones Report (11.21.22.3)
- End User Time Zone Change Utility (11.21.22.20)
- Server Time Zone Change Utility (11.21.22.22)
- Multiple Time Zones Startup Utility (11.21.22.24)

It is best to use menu-level security on these programs, with the possible exception of the report and inquiry. Do not change time zone information without carefully evaluating the impact.

Note Multiple Time Zones Maintenance, Inquiry, and Report are also located on the Multiple Time Zones Setup menu (36.16.22) in Manager Functions.

Multiple Time Zones Startup Utility

Use Multiple Time Zones Startup Utility (11.21.22.24) to activate MTZ in a new or existing database. The first time you activate MTZ, the startup utility can load a set of sample data based on a snapshot of time zone information. The data assists in the setup process, and is a sample only.

After you load this data, verify that the time zones are valid and appropriate for your business practices. Use Multiple Time Zones Report or Inquiry to review definitions and ensure they conform to your requirements. Each organization is responsible for maintaining and updating time zone data to correspond to changing realities and business requirements.

If needed, you can delete existing time zone data and reload the sample data.

When you activate Multiple Time Zones, specify a valid time zone for your server machine. If you do not load default time zone data, you must create the server time zone with Multiple Time Zones Maintenance before

you run the utility. Once MTZ is activated, you can no longer change the Server Time Zone field in System/Account Control (36.1). It is updated by SSM programs.

The startup utility makes the following changes when you initially activate MTZ:

- Optionally deletes existing time zone data and loads a set of default time zones.
- Sets Server Time Zone and Multiple Time Zones in Service Management Control. Also sets the Server Time Zone field in System/Account Control (36.1).
- Sets Database Time Zone in Service Management Control to the server time zone, if it is blank.
- Initializes all customer, end user, and engineer address records so their associated time zones are the server time zone.

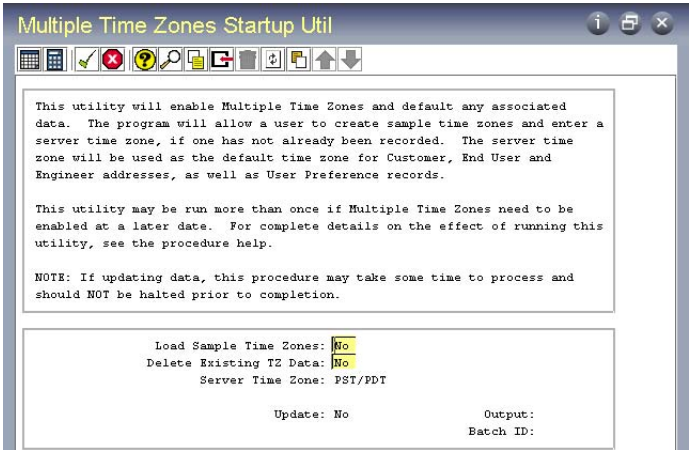
Note You can only specify the server time zone the first time you activate Multiple Time Zones. Use Server Time Zone Change Utility (11.21.22.22) to make changes later.

The utility performs all necessary database conversions, then sets the MTZ field to Yes. If the utility aborts for some reason, MTZ is still No. Re-execute the utility to complete the conversion.

Screen Reference

Figure 4.3 illustrates Multiple Time Zones Startup Utility.

Fig. 4.3
Multiple Time Zones Startup Utility (11.21.22.24)


Multiple Time Zones Startup Util
This utility will enable Multiple Time Zones and default any associated data. The program will allow a user to create sample time zones and enter a server time zone, if one has not already been recorded. The server time zone will be used as the default time zone for Customer, End User and Engineer addresses, as well as User Preference records.
This utility may be run more than once if Multiple Time Zones need to be enabled at a later date. For complete details on the effect of running this utility, see the procedure help.
NOTE: If updating data, this procedure may take some time to process and should NOT be halted prior to completion.
Load Sample Time Zones: No
Delete Existing TZ Data: No
Server Time Zone: PST/PDT
Update: No
Output:
Batch ID:

Load Sample Time Zones. Yes indicates you want the system to load sample time zone data. You can use this data as the basis for your own time zone maintenance.

After loading, verify that the time zones are valid and appropriate for your business. Use Multiple Time Zone Report or Inquiry to ensure the definitions conform to your requirements.

Delete Existing TZ Data. The system checks this field only when Load Sample Time Zones is Yes. If you are loading time zone data, you can also delete current time zone definitions. Use this feature if you rerun the startup utility and want to reinitialize the sample data.

Server Time Zone. You can only update this field when you first activate MTZ. It must be a valid time zone you load with the default data or define with Multiple Time Zones Maintenance.

This value defines the server machine's time zone for the current database. When you execute the startup utility, the system initializes the time zone for each customer, end user, and engineer address record to the server time zone. This time zone serves as a base for all time zone conversions.

This value displays in Service Management Control and in System/Account Control (36.1). Once defined, use Server Time Zone Change Utility to modify it.

Update. Indicates whether you want the startup utility to be report-only or change the database:

No: Execute the utility without changing database records. A report lists the records affected.

Yes: Complete the setup required to support and optionally activate Multiple Time Zones.

Tip
Always execute the program with update set to No before actually making changes.

End User Time Zone Change Utility

Use this program for two distinct purposes:

- Set up the correct time zone information for existing end users when you activate Multiple Time Zones.
- Change the time zone associated with an end user if that end user's geographical location changes.

This utility updates each end-user record as a separate transaction. If it aborts for some reason, you can rerun it without adversely affecting database records.

Changing End Users During Activation

When you first activate MTZ, you initialize all time zones to the server time zone. You must then establish the correct time zone for end users in each geographic region. Do this for groups of end users you select by state, postal code, or country.

Initially, the conversions performed by this utility differ depending on your response to the Current Times Relative to End User prompt. Use this prompt to tell the system how you normally entered call times in the past.

Yes means you entered times on calls for this end user relative to the their time zone. Specify Yes if you *manually* updated the date and time fields on a call to reflect the end user's geographic location.

Example A Los Angeles business has end users in New York. When the business took calls from these end users, the service operator routinely adjusted the call open time manually to reflect the time zone difference since, prior to activating MTZ, the system did not adjust for time zones.

If you accepted the date and time suggested by the system, the date and time associated with the call are not relative to the end user. They reflect the time zone of your server machine.

Changing End Users After Using MTZ

When MTZ is active and you create an end user, you must specify a time zone. This is true in End User Address Maintenance and in the other programs where you create end users such as Call Maintenance, Call Quote Maintenance, RMA Maintenance, Contract Maintenance, and Contract Quote Maintenance.

Once an end-user record exists, you can only change the time zone using End User Time Zone Change Utility. This is because the utility also updates each call associated with the end user so that call dates and times reflect the correct time zone.

When used for this purpose, you should leave the default Yes in the Current Times Relative to End User prompt. After MTZ is active, the system always stores time relative to the end-user time zone.

Note Normally, you can update the time zone associated with a customer in Customer Maintenance. However, if the customer is also an end user, the two records share the same address information and you must use this utility to update the customer time zone.

Screen Reference

Figure 4.4 illustrates End User Time Zone Change Utility.

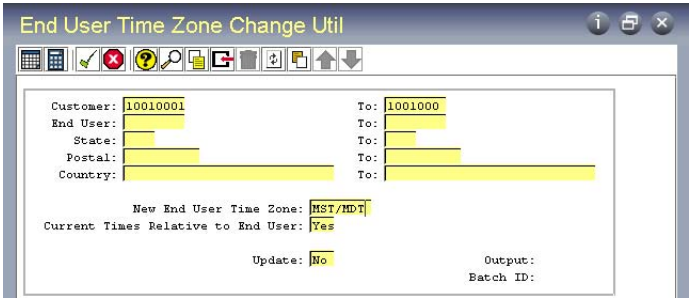


Fig. 4.4
End User Time Zone Change Utility (11.21.22.20)

Customer/To. The first and last customer in a range for selecting end users to update. This utility does not update customer records unless the customer is also an end user. Update the time zone associated with a customer who is not an end user in Customer Maintenance (2.1.1).

End User/To. The first and last end user in a range to be updated when you execute this utility. The system applies New End User Time Zone to these end users and updates open dates and times on their associated calls.

State/To. The first and last state in a range for selecting end user records to update.

Postal/To. The first and last postal code in a range for selecting end user records to update.

Country/To. The first and last country in a range for selecting end user records to update.

New End User Time Zone. Enter the time zone to be associated with end-user records updated by this utility. This must be a valid time zone in Multiple Time Zones Maintenance.

In addition to updating end-user time zones, the utility updates every call associated with the end users so that call dates and times reflect the correct time zone.

Current Times Relative to End User. Indicates how the system should interpret the times on calls for this end user.

If you are running this utility as part of the initial setup for time zones, enter Yes if your organization manually updated the date and time on calls to reflect the time zone of the associated user. Enter No if you accepted the time suggested by the system, which is the equivalent of the server time zone.

Tip
For initial startup, this is usually No.

If you are changing the time zone associated with an end user after you implemented MTZ, leave the default Yes. Once the utility has converted the time zones, times are relative to the end user.

Tip
Always execute the program with update set to No before actually making changes.

Update. Indicates whether the utility should be report-only or make changes to the database:

No: Leave the database records unchanged and generate a report listing the records affected. The report indicates how many call records the system must change to reflect the changes in end user time zones.

Yes: Modify the selected end-user records and related call dates and times.

Server Time Zone Change Utility

This utility adjusts the time zone information in the database to correspond to a new server time zone. You might never need this utility unless you move your business or computing center to a new time zone.

This adjustment is important since the server time zone is the baseline for storing most call date and time information, which the system converts for display. For these conversions to show consistent end-user dates and times, you must change the old server times.

When the utility executes, it adjusts the dates and times related to calls. You can also update engineer records. The system changes engineer time zones that match the old server time zone to the new server time zone. Use this option if you are relocating your IS facilities and service engineers and you want to keep the time zones synchronized.

This utility updates the server time zone in both Service Management Control and System/Account Control (36.1).

Note This utility does not change the database time zone. Manually adjust it in Service Management Control if it no longer reflects the correct time zone.

Plan carefully before you change server time zones. If you have a large number of call records to convert, this utility is time consuming. Execute it in report-only mode first so you know how many records you are updating.

Important If this utility terminates before completion, it may leave some records partially converted. *Run it to completion to avoid data corruption.* Before executing this utility, perform a backup. If the utility terminates abnormally, restore the data from the backup before you rerun it.

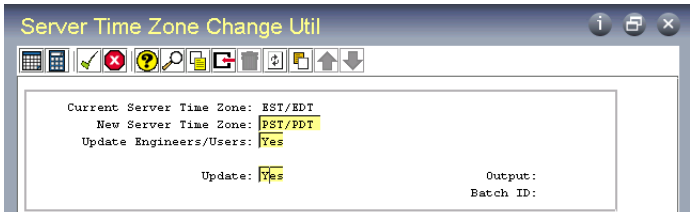


Fig. 4.5
Server Time Zone Change Utility (11.21.22.22)

Current Server Time Zone. Displays the time zone you specified for the database server machine.

New Server Time Zone. Enter the time zone where the server resides. This must be a valid time zone in Multiple Time Zones Maintenance. The utility converts the times in Current Server Time Zone to the one in New Server Time Zone.

Update Engineers/Users. When you create an engineer record, the time zone defaults from the server time zone. If your engineers are moving to correspond to the new location of the server machine, you can have the utility update engineer time zones.

Yes: The utility updates each engineer record with a time zone matching the current server time zone so that it matches the new server time zone.

No: Only call time information is updated.

Update. Indicates whether the utility should be report-only or make changes to the database.

No: Leave the database records unchanged and generate a report listing the records affected. The report indicates how many call records the system must change to reflect the change in server time zone.

Yes: Modify the selected server time zone, related call dates and times, and, optionally, engineer records.

Tip
Always execute this utility with update set to No before actually making changes.

Multiple Time Zones Maintenance

Use Multiple Time Zones Maintenance (11.21.22.1) to define and modify time zones.

Note Multiple Time Zones Startup Utility creates sample data upon which you can base your own time zones.

This program supports two ways of setting up a time zone:

- In the simplest format, you can base a time zone on an offset from GMT.
- The system can also track daylight savings time adjustments from a baseline you set.

If you choose the second approach, you must specify when the change in time occurs. You can also use effective dates with time zone information, if the start and end points for daylight savings time only apply for a range of years.

After you define the time zones, you can generate reports with Multiple Time Zones Inquiry (11.21.22.2) and Multiple Time Zones Report (11.21.22.3). A time zone lookup displays on the time zone field throughout service functions. Because of size restrictions, this lookup displays only the standard GMT offset for the time zone, even if you defined it with adjusted periods.

Figure 4.6 illustrates Multiple Time Zones Maintenance.

Fig. 4.6
Multiple Time Zones Maintenance (11.21.22.1)

Time Zone. Enter an eight-character label identifying a time zone.

Description. Enter up to 40-characters describing this time zone. The description appears on the time zone pop-up in various service functions.

Auto Period Adjust. This field indicates whether the system should adjust the time zone you are defining for a given period—usually daylight savings time or its equivalent.

Yes: Define the period to be adjusted in the subsequent detail frame.

No: Time Period defaults to STD (standard). You cannot change it.

Time Period. This field is editable if Auto Period Adjust is Yes. Valid choices are STD for standard time, Day for daylight-saving time, and Sum for summer time. You can define details for two periods: a standard period, and a special adjusted period for daylight savings or its equivalent. This field determines which of the detail fields are required.

Tip
Set up values for time period as language details to reflect the terms you use.

Start Year. The beginning year of a range, to which this time zone definition applies. In some countries, the implementation of time zones varies from year to year. Using start and end dates, you can set up multiple records effective at different periods of time.

End Year. The ending year of a range, to which this time zone definition applies. If you do not know when the current definition ceases to be effective, use an end year such as 9999.

GMT Offset. Enter the actual offset in hours and minutes from Greenwich mean time (GMT) for this time zone. Enter this number with either a plus sign (+) or minus sign (–) indicating the direction of the offset.

GMT is the base for establishing the relationships among time zones and is never affected by daylight-saving time adjustments.

Start Period. Only required if Auto Period Adjust is Yes. The first day of the week when the change of time occurs, entered in MM/DD format. For the United States, daylight-saving time normally begins on the first Sunday in April—identified by a start date of 04/01—and ends on the last Sunday in October—identified by a start date of 10/25.

Tip
Use the MM/DD format regardless of the date format you use.

This field, in conjunction with the Weekday and Time fields, identifies precisely when the time change occurs.

Tip
In the U.S., time changes always occur on Sunday (1).

Weekday. Only required if Auto Period Adjust is Yes. A number from 0 to 7 indicating the day of the week—identified by the Start Period field—when the time change occurs.

- Enter 0 if the change occurs on the date in the Start Date field, regardless of the day of the week on which it falls.
- Enter a number in the range 1-7 corresponding to Sunday through Saturday if the change occurs on a certain day of the week.

Time. Only required if Auto Period Adjust is Yes. The exact time of day—identified by the Start Period and Weekday fields—using a 24-hour clock, when the time change occurs. Enter this time in standard time.

In the United States, enter 02:00 when switching from standard time to daylight-saving time, but 01:00 when switching from daylight savings time back to standard.

Effects of MTZ

MTZ has wide-ranging effects on other service functions. The areas impacted, discussed in this section, include:

- Customers and end users
- Installed base
- Call management
- Engineer scheduling

Customers and End Users

If MTZ is active, you can associate time zones with customers and end users. The time zone for new end users defaults from the customer.

Customer Maintenance (2.1.1)

Figure 4.7 illustrates the pop-up that appears in Customer Maintenance (2.1.1) when MTZ is active. The system uses the customer time zone as the default for end users associated with this customer.

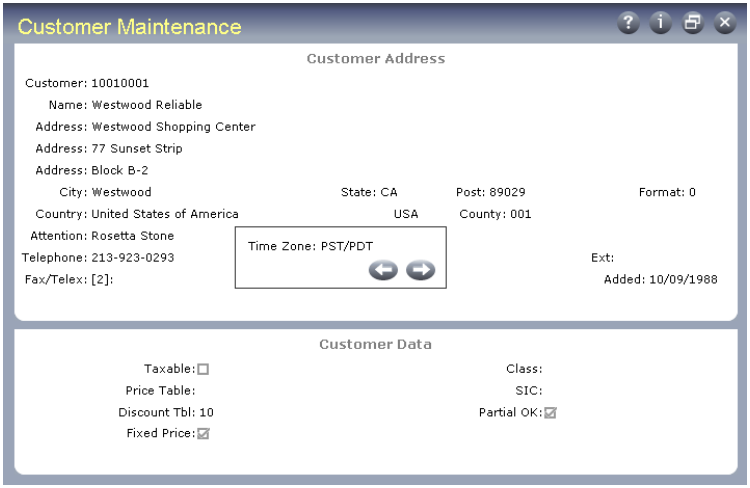


Fig. 4.7
Time Zone Pop-Up in Customer Maintenance (2.1.1)

Note If a customer is also an end user, you cannot change the time zone in Customer Maintenance.

End User Address Maintenance (11.9.1)

As illustrated in Figure 4.8, when MTZ is active, a Time Zone field also displays in End User Address Maintenance. The time zone here determines how Call Maintenance displays and stores times when you take a call for this end user. The end user's time zone also affects engineer scheduling, service coverage, and service pricing.

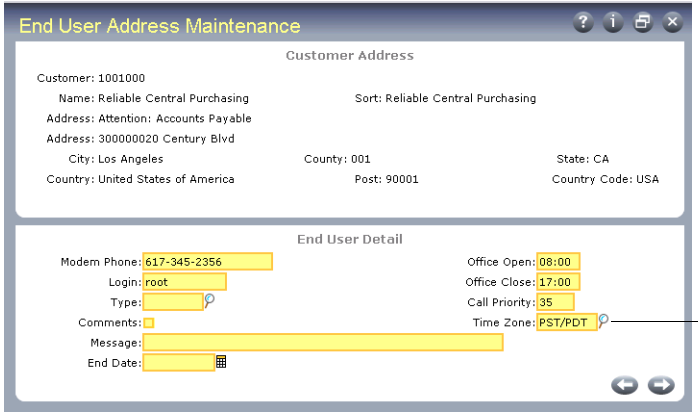


Fig. 4.8
Time Zone Field in End User Address Maintenance (11.9.1)

The time zone field initially defaults from the end user's customer; you can update it only when creating an end user. After an end-user record exists, use End User Time Zone Change Utility (11.21.22.20) to change the time zone. This utility ensures that the system updates any calls for the end user to reflect the new time zone.

Time Zones and Call Management

Time zones have their most significant impact on managing calls, since calls represent real time contact with end users. When MTZ is active, most call dates and times display relative to the end user's time zone, while the system stores them in the server time zone.

MTZ does not just affect time displays. When the system searches for data based on dates and times, the time it uses is relative to the end user's time zone. This applies to contract coverage, pricing calculations, and service BOMs and routings.

Call Maintenance (11.1.1.1)

When MTZ is active, the end user's time zone displays as part of the address information in the Call Maintenance header. If you create the end user directly with Call Maintenance, the system prompts you to specify a time zone for the new end user.

The default call open date and time display relative to the end-user time zone. These fields are updated after you specify an end user, since the system needs to know the end user's time zone to convert them correctly. You can change the call open date and time when you open a call; afterward they are display only.

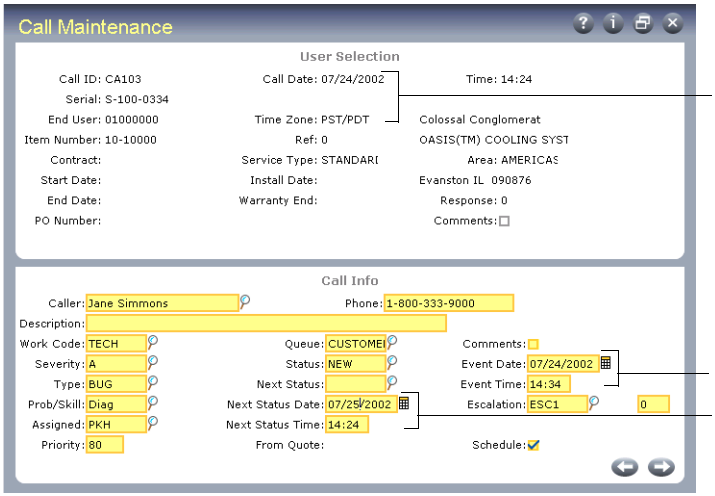


Fig. 4.9
Effect of MTZ in Call Maintenance Header Frames

If the user has defined a preferred time zone using Service/Support User Preferences, the date and time associated with call comments reflects this value. Otherwise, they default from the server time zone.

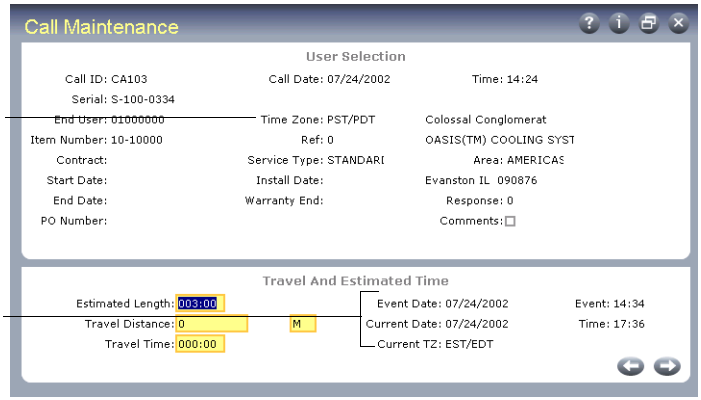
See “User Preferences” on page 156 for details.

The dates and times in the Call Info frame also display relative to the end user’s time zone, including Next Status Date, Next Status Time, Event Date, and Event Time.

Travel and Estimated Time Frame

When MTZ is active, the call Event Date and Time values set in the previous frame display on the Travel and Estimated Time pop-up. The current date, time, and the current time zone also display. The current date and time are relative to the time zone of the current user, if the user has a preferred time zone. Otherwise, the system uses the server date and time.

Fig. 4.10
Effect of MTZ in Call Maintenance Travel and Estimated Time Frame



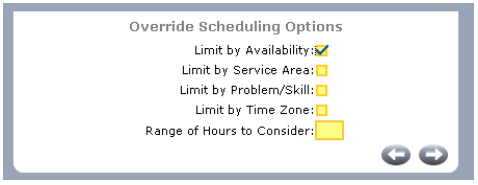
In this example, the three-hour difference between and PST/PDT EST/EDT is apparent when comparing the Event Time and Current Time values.

Override Scheduling Options Pop-up

See "Defining Scheduling Rules" on page 578 for details.

If you use engineer scheduling and MTZ is active, Call Maintenance is affected. If Override Scheduling Options is Yes in Engineer Schedule Control, you can modify the Limit by Time Zone and Range of Hours to Consider fields in the scheduling options pop-up. Otherwise, these fields do not display.

Fig. 4.11
Override Scheduling Options Pop-Up



Limit by Time Zone. Defaults from Engineer Schedule Control and indicates whether the system should consider only engineers with a time zone matching the time zone of the call end user.

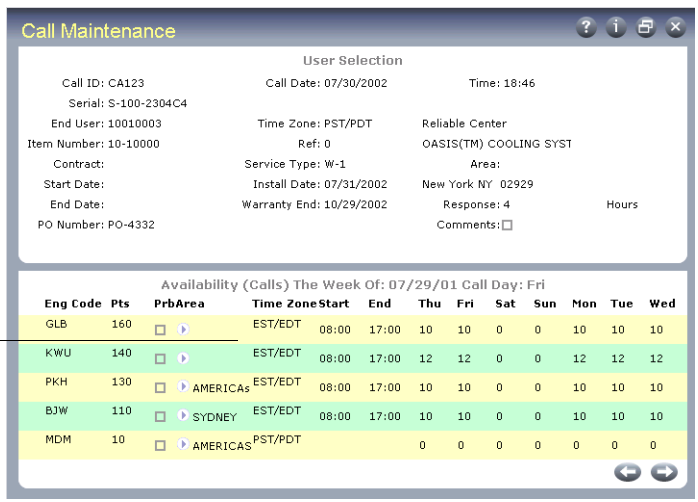
The system uses this field in conjunction with Range of Hours to Consider. If you enter zero, the time zones must match exactly. An integer value indicates the number of hours less than or greater than the end-user time zone considered a match for scheduling.

Range of Hours to Consider. Defaults from the value in Engineer Schedule Control. The system considers it only when Limit by Time Zone is Yes.

- It indicates how many other time zones the system can include for scheduling. Blank indicates the engineer's time zone must exactly match the time zone of the call's end user.
- An integer value indicates any time zone in a range is a match. The integer represents the number of time zones more or less than the end user's considered a match for scheduling.

Engineer Availability Pop-Up

The availability pop-up, illustrated in Figure 4.12, displays a time zone column instead of the engineer's schedule.


Call Maintenance
User Selection
Call ID: CA123
Call Date: 07/30/2002
Time: 18:46
Serial: S-100-2304C4
End User: 10010003
Time Zone: PST/PDT
Reliable Center
Item Number: 10-10000
Ref: 0
OASIS(TM) COOLING SYST
Contract:
Service Type: W-1
Area:
Start Date:
Install Date: 07/31/2002
New York NY 02929
End Date:
Warranty End: 10/29/2002
Response: 4
Hours
PO Number: PO-4332
Comments:
Availability (Calls) The Week Of: 07/29/01 Call Day: Fri
Eng Code Pts PrbArea Time Zone Start End Thu Fri Sat Sun Mon Tue Wed
GLB 160 EST/EDT 08:00 17:00 10 10 0 0 10 10 10
KWU 140 EST/EDT 08:00 17:00 12 12 0 0 12 12 12
PKH 130 AMERICAs EST/EDT 08:00 17:00 10 10 0 0 10 10 10
BJW 110 SYDNEY EST/EDT 08:00 17:00 10 10 0 0 10 10 10
MDM 10 AMERICAS PST/PDT 0 0 0 0 0 0 0

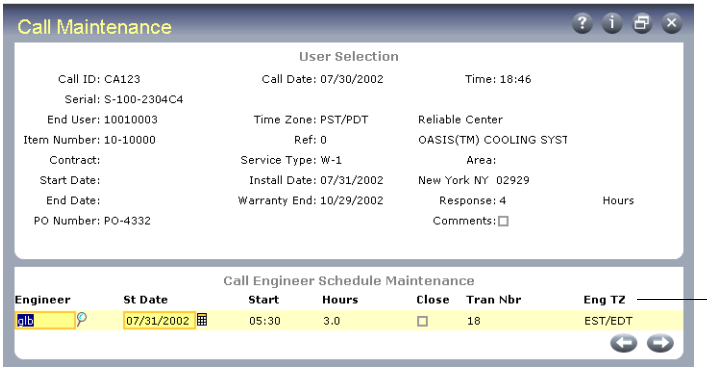
When MTZ is active, engineer time zone displays, rather than the active schedule.

Fig. 4.12
Effect of MTZ in Call Maintenance

Call Engineer Schedule Maintenance Frame

When you exit the availability pop-up, the Call Engineer Schedule Maintenance frame displays, as illustrated in Figure 4.13. Use this frame to modify the estimated number of hours to be worked and the start date and time.

Fig. 4.13
Effect of MTZ in Call Maintenance



When MTZ is active, engineer time zone displays, rather than area.

When MTZ is active, the scheduled start date and time are in the end user's time zone, which is displayed in the Call Maintenance header. The engineer time zone displays for reference in the Eng TZ column. If MTZ is not active, the engineer's area displays instead, labeled Eng Area.

Displaying Call Information

When MTZ is active, most SSM inquiries and reports that display call data let you choose how the system presents time information. Choose from a list of display time zones, including some or all of the following:

- Time zone of the call's end user, from End User Address Maintenance
- Time zone of the call's assigned engineer, from Engineer Maintenance
- Server time zone, defined during MTZ setup
- Database time zone, from Service Management Control
- Current user's time zone, from Service/Support User Preferences

Select Other to manually enter any other valid time zone.

Figure 4.14 illustrates the Display Time Zone pop-up in Call Inquiry (11.1.1.2).

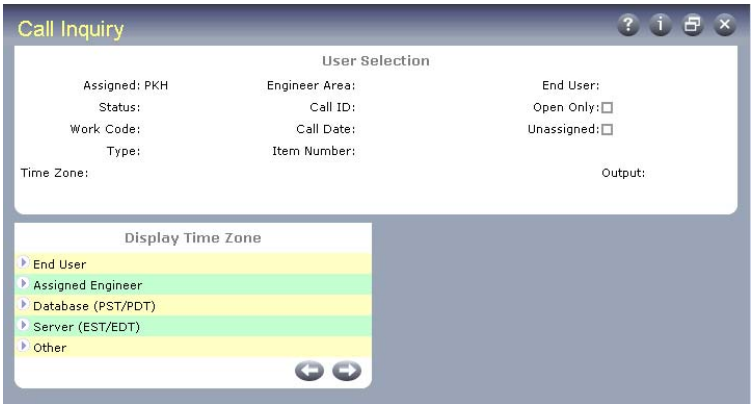


Fig. 4.14
Display Time Zone Pop-Up Window

Select the option you want to use. If you choose Other, you are prompted to enter a valid time zone.

Note Display options depend on which program you are using. If a call function does not have an end user or engineer, these options do not appear.

When the display option for a call report is the server time zone, database time zone, current user's time zone, or a time zone you entered, call open dates and times all display in the same time zone. If the display option is the time zone of the call's end user or assigned engineer and you review a range of calls, you may be viewing dates and times in more than one time zone, since the time zone may differ among end users and engineers.

If you use the call open date as a selection criterion for reporting, the system interprets the date relative to the display time zone you choose.

Example A company located in Los Angeles, the server time zone, takes two calls on April 14, one from an end user in Los Angeles and one from an end user in New Zealand.

Now you generate a report in Call Inquiry with a selection date of 04/14/02. If the display option for Call Inquiry is the server time zone, the system selects both calls. If the display option is the end-user time zone, the system selects only the call from Los Angeles. From the point of view of the end user in New Zealand, you opened the second call on 04/15/02.

Reports and Inquiries Affected

Call inquiries and reports affected by MTZ include the following:

- Call Inquiry (11.1.1.2). The Time Zone Display pop-up appears before the Output field and a field labeled TZ displays your choice. When MTZ is active, the end user's time zone labeled EUTZ replaces the call area output column.
- Call Detail Inquiry (11.1.1.3). The Time Zone Display pop-up appears before the Output field and a field labeled Display TZ displays your choice. When MTZ is active, the system includes in the report two fields labeled End User TZ and Display TZ. The system uses the display time zone you choose to convert the call's open and closed dates for output, and the event and next status dates and times in the call history output lines.
- Call Print (11.1.1.4). The Time Zone Display pop-up appears before the Output field and a field labeled Report TZ displays your choice. When MTZ is active, the system includes in the report two fields labeled End User TZ and Report TZ. The system uses the display time zone you choose to convert the call's open, event, and next status dates and times before displaying them. It also determines how the system interprets Next Date.
- Call Print from Call Maintenance/Escalation Monitor. If you choose to print calls from Call Maintenance or if an escalation step automatically prints a call, you do not have an opportunity to enter a display time zone. In these cases, dates and times are relative to the time zone of the call's end user.
- Call Print with History (11.1.1.5). Same changes as for Call Print.
- Total Calls by Assigned Inquiry (11.1.19.1) and Total Calls by Queue Inquiry (11.1.19.2). The system compares Date From with the call open date relative to the end user's time zone.

Recording Call Activity

Call Activity Recording and Call Invoice Recording are both affected by activating MTZ. In general, as in Call Maintenance, most call dates and times are relative to the end user's time zone. The exception is the tax date. Since it is related to tax tables used system-wide, it is not converted to the end user's time zone. It remains relative to the server time zone, like other tax dates in the system.

- The time zone of the call's end user appears at the top, right-hand corner of the CAR header frame.
- The system bases pricing, charge codes, and limits processing on the call open date relative to the end user's time zone. It uses the same logic to search for effective dates on BOMs and routings.
- The labor start date and time and end time on the Labor/Expense Detail frame are relative to the end user's time zone.
- If the Dates field in the Call Line Status frame is Yes, the Display Time Zone selection list lets you specify a time zone to use. This is because the engineer actually doing the work on the call, or a clerical/support person somewhere else, could be entering these dates and times. The Complete Date is an exception. Since no time is associated with the date, it is relative to the end user's time zone, regardless of the display time zone you choose.
- The Display Time Zone selection list may also appear before the Call Status frame in Call Activity Recording, if you did not select it previously. The time zone affects the display of Complete Date and Time, Close Date and Time, and the Next Status Date and Time fields.

Call Queue Manager (11.1.6)

Like many of the call reports and inquiries, you can select a display time zone from the Call Queue Manager when MTZ is active. The next status date and next status time of each call record display relative to the time zone you select.

Tip
If Queue Manager is 0 in Call Management Control, this sort is used.

If you normally display calls sorted by Next Status Date/Time, be aware of the following. The Next Status Date/Time index is based on the way the system stores call dates and times in the server time zone. When call dates and times are relative to a different time zone, they may appear to be out of order.

In the Call Queue Manager, the call next status date and time in the edit pop-up window also appear relative to the display time zone you select.

Call Generator (11.1.8)

The dates and times in the Call Generator are relative to the time zone of the end user for which you are generating a call. These dates include the call open date and any dates you use as selection criteria, such as ranges of ship dates or next PM dates. The same applies to dates on a field notification you create from the Call Generator.

Escalation Monitor (11.1.13.13)

Dates and times in the Escalation Monitor output remain relative to the server time zone. However, if an escalation step prints a call, the system assumes it should display the date and time information on the call in the end user's time zone.

Call Quotes

Call Quote Maintenance (11.1.1.7) resembles Call Activity Recording and supports multiple time zones similarly:

- The time zone of the call end user appears at the top, right-hand corner of the CAR header.
- The quote's Expire date is relative to the end user's time zone. The time you opened the quote, relative to the end user's time zone, determines the expiration time.

- The system bases pricing, charge codes, and limits processing on the call open date relative to the end user's time zone. It uses the same logic to search for effective dates on BOMs and routings.
- You enter the labor start date and time and end time on the Labor/ Expense Detail frame relative to the end user's time zone.

Call Quote Reports

Call quote reports and inquiries correspond to call reports and inquiries:

- Call Quote Inquiry (11.1.1.8). The Time Zone Display pop-up appears before the Output field, and a field labeled Display TZ displays your choice. Enter an Expire Before value relative to the display time zone; expiration dates display that way in the output.
- Call Quote Detail Inquiry (11.1.1.9). The quote's expiration date displays relative to the end user's time zone.
- Call Quote Print (11.1.1.10). The Time Zone Display pop-up appears before the Output field and a field labeled Report TZ displays your choice. When MTZ is active, the system includes two fields labeled End User TZ and Report TZ output. The system uses the display time zone you choose to convert the quote's open dates and times before displaying them and to interpret the Quote Date value.

Call Quote Release to Recording (11.1.1.11)

You enter the Quote Date range and the Call Date value relative to the end user's time zone, since the system uses Call Date to find default charge codes and limit coverage.

Copy Call Quote (11.1.1.12)

The end user's time zone of the source quote appears at the top right of the header and is the time zone for the new quote. You enter the Quote Date and Expire date values—and they display—relative to the end user's time zone.

Time Zones and the Installed Base

See page 54 for details about this function.

Most dates and times in the installed base are relative to the end user's time zone, both when Installed Base Item Maintenance (11.3.1) creates ISB records directly and when you create them as part of another service activity such as RMAs or calls. Install Date, Warranty Expiration Date, Last PM Date, and Next PM Date are among the fields affected.

The exception is any date set by programs outside the Service/Support module, such as Invoice Post. Since these programs are outside the scope of SSM, they update ISB records with the system date and time.

The install date is important in determining valid warranty coverage. If end users are far enough away that time zone differences create date differences, you can manually update the install date created by invoice post.

Sales order routines also set the Ship Date value displayed in Installed Base Item Maintenance. This date reflects the server time zone.

Time Zones and Service Contracts

Contracts follow the general rule that applies to calls and the installed base when MTZ is active. All contract dates and times are relative to the time zone of the end user on the contract.

The system searches for call coverage using the call open time relative to the end user's time zone. It also determines if the day is a holiday, relative to the end user's time zone.

For contract coverage to be considered valid, the call open date must be within the contract line's start and end dates. The contract's currency must also match the call's. If more than one service type applies to call item, the system checks to see if the call's open time falls in the available hours for the contract line's service type.

The system uses the same algorithm to determine limit consumption when you post a call invoice. It uses the call open date relative to the end user's time zone to determine the effective limits. You cannot modify the start and end dates of the contract header or lines to exclude an attached call's open date. This is also true of limit records. You cannot modify the effective dates to exclude the open date of a call that references them.

Time Zones and Engineer Scheduling

Multiple Time Zones has a significant impact on call scheduling options and on how the system interprets a call's next status date and time.

- Use Engineer Maintenance (11.13.1) to associate a time zone with an engineer.
- You assign scheduling points in Engineer Schedule Control (11.13.15.24) based on matching time zones, either exactly or within a range.You can optionally limit engineers to consider for scheduling to those with time zones matching a call's end user.
- Schedule times are either relative to the time zone of a call's end user or relative to the time zone of the engineer, depending on Field Engineer in Engineer Maintenance.
- You must select a display time zone before generating most engineer reports and inquiries.

See Chapter 16, "Engineers and Scheduling," for full details about scheduling options.

When you are using MTZ, you can choose how date and time information displays in most call reports and inquiries. The engineer's time zone is one of the available choices.

Engineer Maintenance (11.13.1)

Use Engineer Maintenance (11.13.1), illustrated in Figure 4.15, to define engineers.

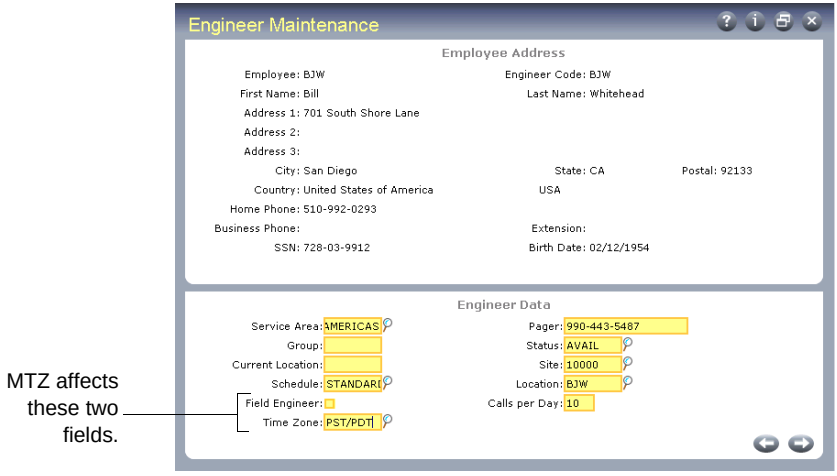


Fig. 4.15 Engineer Maintenance (11.13.1)

When MTZ is active, a Time Zone field displays and Field Engineer has a special significance. Time Zone defaults from the Server Time Zone and is validated against time zones you create with Multiple Time Zones Maintenance.

The engineer's time zone should reflect the time zone where the engineer is located. It is used in conjunction with Field Engineer, which indicates whether this engineer normally works at your site or at the end-user site.

- When Field Engineer is No, the system interprets the schedule times for this engineer relative to this time zone.
- When Field Engineer is Yes, the system interprets schedule times relative to the end user's time zone.

The system considers the engineer time zone during call scheduling. It awards an engineer points according to Engineer Schedule Control if the engineer time zone matches the time zone of a call's end user or is within the range of Range of Hours to Consider.

Engineer Assignment Maintenance (11.13.15.8)

The display time zone pop-up is discussed in detail on page 146.

Call engineers use this function to maintain scheduling transactions created in Call Maintenance. When MTZ is active, the engineer's time zone, labeled Time Zone, displays in the header frame. You select a display time zone from a pop-up list before you access transactions.

Your time zone selection appears in the header frame, labeled Display TZ. The system uses it to convert the scheduled start date and time of each record for display.

To provide a complete reference point, the time zone of the call's end user also displays on the schedule detail line.

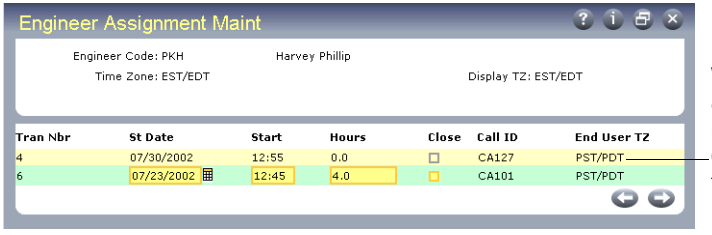


Fig. 4.16 Engineer Assignment Maint (11.13.15.8)

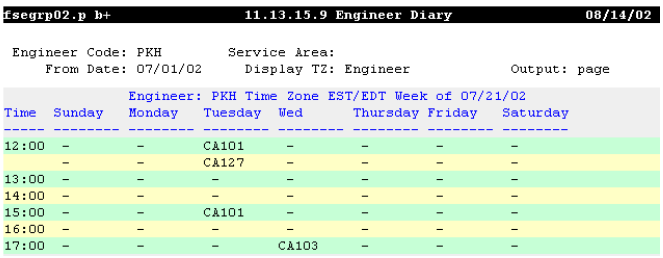
Note When MTZ is not active, the call's area displays instead of the end user's time zone.

Engineer Reports

Most engineer reports accommodate time-zone data.

Engineer Diary (11.13.15.9)

Engineer Diary displays the transactions created in Call Maintenance or in Engineer Assignment Maintenance. This report provides engineers with an overview of their call assignments for a week.



```
fsegrp02.p b+                  11.13.15.9 Engineer Diary                  08/14/02

 Engineer Code: PKH        Service Area:
     From Date: 07/01/02     Display TZ: Engineer            Output: page

                Engineer: PKH Time Zone EST/EDT Week of 07/21/02
Time  Sunday   Monday   Tuesday  Wed      Thursday Friday   Saturday
----- -------- -------- -------- -------- -------- -------- --------
12:00 -        -        CA101    -        -        -        -
      -        -        CA127    -        -        -        -
13:00 -        -        -        -        -        -        -
14:00 -        -        -        -        -        -        -
15:00 -        -        CA101    -        -        -        -
16:00 -        -        -        -        -        -        -
17:00 -        -        -        CA103    -        -        -
```

Fig. 4.17
Engineer Diary (11.13.15.9)

When Multiple Time Zones is active, the dates and times in this inquiry are relative to a selected display time zone, which appears in the top frame labeled Display TZ.

The display time zone list does not include end user as a choice for this function, because output must be in one time zone, and the time zone of end users associated with calls can vary from call to call.

The title of the output frame includes the engineer's time zone.

Note If an engineer supports calls across time zones, use another display to review planned activity, since you cannot see the source of the call in this one.

Engineer Calendar (11.13.15.10)

This inquiry displays the normal work schedule for one or more engineers you select by engineer code, service area, problem and skill code, and date range. Its appearance does not change when MTZ is active, but if Field Engineer is Yes, the schedule time is relative to the end user on a call; if it is No, the schedule time is relative to the engineer's time zone.

Engineer Availability Inquiry (11.13.15.11)

This inquiry simulates the availability information in Call Maintenance. When MTZ is active, like Call Maintenance, this simulation takes into account time zone matching.

The scheduling limits in Engineer Schedule Control affect this inquiry in the same way they affect Call Maintenance. If Override Scheduling Options is Yes in Engineer Schedule Control, the pop-up displays where you can override the fields that limit the set of engineers to consider. When MTZ is active, Time Zone Points and Range of Hours to Consider display on the pop-up.

In the display time zone pop-up you can also select a time zone for displaying information from a limited number of choices. Since the system is not calculating availability for a particular call, the end user and assigned engineer are not valid choices.

Tip
Set the value of Field Engineer and Time Zone in Engineer Maintenance (11.13.1).

The display time zone affects the way the system interprets availability. The system views schedule times for field engineers relative to the display time zone value. If Field Engineer is No, the system views the engineer's schedule times relative to their personal time zone.

Example You enter availability for 04/17/02 at 23:00. The display time zone is MST/MTD and Limit by Availability is Yes. Engineer Joe in Sydney, Australia normally works from 8:00 to 17:00. At 23:00 MST/MTD, it is 17:00 in Sydney. The system considers Joe available at 23:00 MST/MTD if Field Engineer is No for him, since schedule times are relative to his time zone. If he is a field engineer, the system interprets schedule times relative to the display time zone, and considers him unavailable.

See Figure 4.12 on page 145.

The report output is identical to the output in the Engineer Availability frame in Call Maintenance, except it does not include the point totals.

User Preferences

Each user can set up defaults for some fields with Service/Support User Preferences, illustrated in Figure 4.18. When MTZ is active, users can define a preferred time zone with each user. The current user's time zone is one of the display options available for call information and reports.

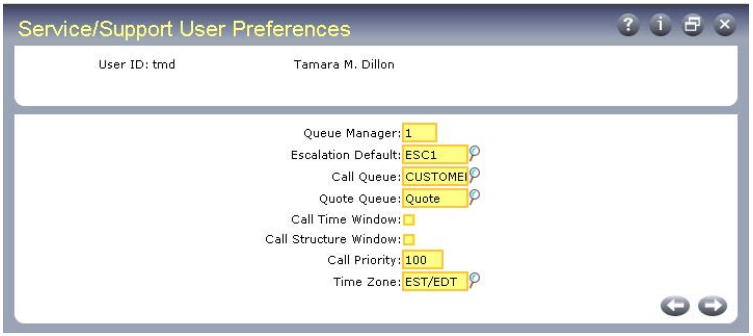


Fig. 4.18
Service/Support User Preferences (11.21.23)

Note Time zone for end users initially defaults from the server time zone defined in Service Management Control. This is true even when a different time zone is associated with the user in User Maintenance (11.3.18).

Other Service Functions

Most other service functions are unaffected by Multiple Time Zones:

- Material orders are unaffected. Since MOs are a type of sales order, dates and times remain relative to the server time zone.
- Service areas are unaffected.
- Service requests are unaffected. Dates and times remain relative to the server time zone.
- Return material authorizations do not change. For consistency with sales orders, dates and times are relative to the server time zone.
- Return to supplier programs are unaffected. For consistency with purchase orders, dates and times are relative to the server time zone.

MTZ Reference

This section contains reference material that might be useful if you write custom reports and need to understand how the system stores and converts dates and times.

Date/Time Fields

The system uses the server time zone to store date and time data in the fields listed in Table 4.1 and converts the data to the end user's time zone for display.

Table 4.1 Fields Stored in Server Time Relative to End User

Field Name	Description
ca_cls_date/time	Call close date/time
ca_comp_date/time	Call completion date/time
ca_evt_date/time	Call event date/time
ca_nxt_date/time	Call next status date/time
ca_opn_date/time	Call open date/time
ca_quote_exp	Call quote expiration date
cah_evt_date/time	Call status history event date/time
cah_nxt_date/time	Call status history next status date/time
cah_opn_date	Call status history open date
chm_cls_date/time	Call history close date/time
chm_comp_date/time	Call history completion date/time
chm_opn_date/time	Call history open date/time
chm_quote_exp	Call quote history expiration date
egt_sched_date	Engineer call schedule date
egt_start_time	Engineer call schedule start time
itm_endown_date/time	Call item end downtime date/time
itm_stdown_date/time	Call item start downtime date/time
itm_nxt_date/time	Call item next status date/time
itm_stjob_date/time	Call item start work date/time
itmh_stdown_date/time	Call item history start downtime date/time
itmh_endown_date/time	Call item history end downtime date/time
itmh_nxt_date/time	Call item history next status date/time
itmh_stjob_date/time	Call item history start work date/time

Field Name	Description
sfb_ca_opn_date	Call billing detail open date
sfh_ca_opn_date	Call billing history open date
wr_start	Call report labor detail start date
wr_st_time	Call report labor detail start time
wr_end_time	Call report labor detail end time
wo_ord_date	Call report order date
so_*/sod_*	All call invoice and call invoice line dates

Date and time data in the fields listed in Table 4.2 reflect the end user's time zone. The system does not convert them to the server time zone.

Table 4.2 End User Time Fields Stored Without Conversion

Field Name	Description
ca_eu_date/time	Call open date/time in end-user time zone
cah_eu_date/time	Call status history open date/time in end-user time zone
chm_eu_date/time	Call history open date/time in end-user time zone
fpc_start	Service pricing effective start date
fpc_expire	Service pricing expiration date
isb_*	All installed base item dates
itm_comp_date	Call item completion date
itmh_comp_date	Call item history completion date
sa_*/sad_*/sap_*/sca_*	All service contract dates and times
sah_*/sadh_*	All service contract history dates and times
sal_*/salh_*	All coverage limits dates
sv_stime[8]	Service type start coverage time
sv_etime[8]	Service type end coverage time

Date and time data in the fields listed in Table 4.3 reflect either an end user's time zone or an engineer's time zone, depending on whether the engineer is a field engineer. The system does not convert these to the server time zone.

Table 4.3 Engineer Related Time Fields

Field Name	Description
egd_start_eff	Engineer detail schedule start effective date
egd_end_eff	Engineer detail schedule end effective date

Field Name	Description
egd_start_time[8]	Engineer detail schedule start shift time
egd_end_time[8]	Engineer detail schedule end shift time
egw_st_time	Engineer availability start shift time
egw_end_time	Engineer availability end shift time
egw_week	Engineer availability start of week date
esh_start_eff	Engineer master schedule start effective date
esh_end_eff	Engineer master schedule end effective date
esh_start_time[8]	Engineer master schedule start shift time
esh_end_time[8]	Engineer master schedule end shift time
fsh_date	Engineer or service area holiday date
ocm_start_eff	Engineer on-call schedule start effective date
ocm_end_eff	Engineer on-call schedule end effective date

Date and time data in the fields listed in Table 4.4 reflect the server time zone. The system stores and displays them without conversion.

Table 4.4
Server Time Zone Fields

Field Name	Description
ca_date/time_stmp	Call creation date/time stamp
cah_date/time_stmp	Call creation status history date/time stamp
chm_date/time_stmp	Call creation history date/time stamp
ca_tax_date	Call tax effective date

Converting Times

The `fstzcon.p` utility converts times from one time zone to another using the four input parameters listed in Table 4.5.

Table 4.5
Input Parameters for `fstzcon.p`

Parameter	Description
from-date	Input date stored in input time zone
from-time	Input character time stored in input time zone with a format of HHMM
from-zone	Input character time zone
to-zone	Output character time zone

Table 4.6 lists the program's three output parameters.

Table 4.6 Output Parameters for `fstzcon.p`

Parameter	Description
to-date	Output date converted to output time zone
to-time	Output character time stored in output time zone with a format of HHMM
effflag	Logical to indicate if an error occurred (date and time will be returned unconverted)

The following example illustrates how to convert the current system time to EST/EDT.

```
define variable from-time as   character format "99:99".
define variable to-date   as   date.
define variable to-time   as   character format "99:99".
define variable errflag   as   logical.
{mfdeclre.i}
find first svc_ctrl no-lock.
assign from-time = string(time,"HH:MM")
       from-time = substring(from-time,1,2)  /* remove colon */
           + substring(from-time,4,2).
{gprun.i ""fstzcon.p""
       "(input  today,
       input  from-time,
       input  svc_server_timezone,  /* svc__qadc01 before 8.7 */
       input  ""EST/EDT"",
       output to-date,
       output to-time,
       output errflag)"}
```

Chapter 5

Contract and Warranty Types

This chapter introduces service types, details how you can use invoice sorts, work codes, and service categories to define levels of coverage, and describes the programs used to define contract types and warranty types.

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Levels and Limits of Service **170**

Contract Type Maintenance **186**

Warranty Types **193**

Overview of Service Types

See Chapter 8, “Service Contracts,” on page 233 for details on how contract types apply to the creation of individual contracts.

Service types define the rules that determine what service activities can take place for covered items and who pays for them. There are two categories of service types:

- Warranty Type Maintenance (11.3.15) sets up warranty types, which you attach to items in the installed base.
- Contract Type Maintenance (11.5.10) sets up contract types, which you use during the creation of contracts.

The service type—warranty or contract—defines defaults such as hours of coverage, levels of service, and under- and over-limit charge codes. Typically, service organizations do not provide warranty or contract coverage for every item. For items not covered by either, the system obtains a default coverage type from control program settings.

Both a warranty and contract can be active at the same time, although it is more common for contracts to become effective when warranties expires.

The agreements represented by service types and contracts determine much of what happens in call management. The service type also affects returned material authorizations (RMAs). These functions retrieve a service type from one of the following:

- The warranty code attached to an installed base record
- A contract that includes the item being serviced or a blanket contract
- A default service type in a control program

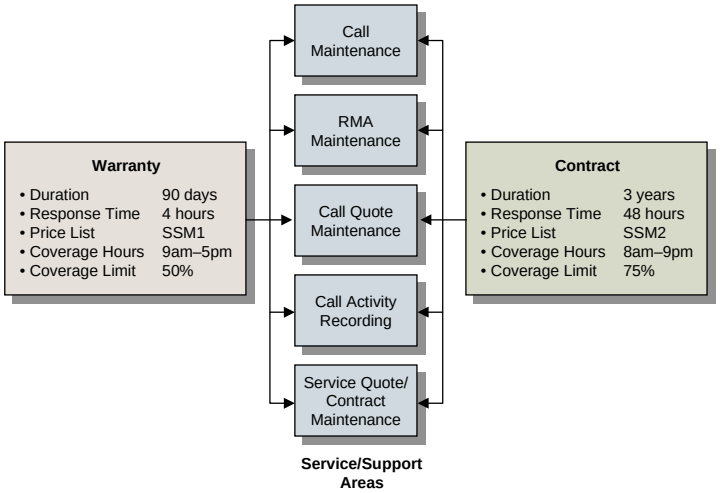


Fig. 5.1
Impact of Service Types

Default Service Types

Generally, warranties and service contracts cover transactions that could otherwise be billable, such as labor, repair items, or expenses. However, you may also receive requests for service on items with an expired warranty or without a current service contract. The Service/Support Management module requires a default service type for these cases.

SSM uses two default service types: one for calls and one for RMAs:

- For calls, specify the default service type in the Default Call Service Type field in Call Management Control (11.1.24).
- For RMAs, specify the default in the Default RMA Contract field in RMA/RTS Control (11.7.24).

Default service types establish basics such as the hours your support department takes calls and your response time to such requests. You must have at least one service type to use Call Maintenance.

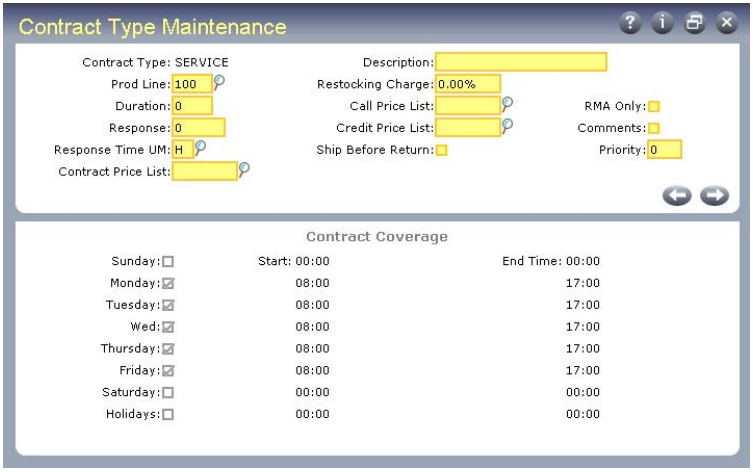
You can use either a warranty or contract type for the RMA default; the call default must be a contract type. Normally, a default service type does not provide any coverage. If you do provide some coverage for items without a contract or warranty, the default service type should specify a covered charge code.

See “Charge Codes” on page 103 for a complete discussion of charge codes.

Service Attributes

Use Contract Type Maintenance to define and update contract types. Figure 5.2 illustrates the first two frames. Warranty Type Maintenance is similar.

Fig. 5.2
Contract Type Maintenance (11.5.10)



Service types define your relationship with customers. The system uses some attributes of the type directly. This is always true for warranties. For contracts, some attributes provide defaults you can change in Contract Maintenance. The system derives the following information from the service type:

See “Product Lines and Service Types” on page 167.

- *Product line* of the service type can direct the financial impact of service into GL accounts.
- *Duration* defines the length of time service is available. You define warranties in days, contracts in months. The duration determines the end date for the warranty of an installed base item and the default end date for a contract.
- *Response time* defines the length of time within which the customer can expect you to respond to a service request. Call Maintenance uses response time and coverage hours to calculate the call’s next event date and time.
- *Price lists* determine what a customer pays for contract coverage, for service on a call, and for items returned on an RMA. RMA issue lines use standard sales order pricing.

- *Ship Before Return and Restocking Charge* affect RMAs only. Ship Before Return determines if you can issue an item on an RMA before you receive the defective one from the customer. This field only affects linked RMA lines. The system applies the restocking charge to items returned for credit. It indicates what portion of the credit to deduct for handling.

See Chapter 21, “Return Material Authorizations,” on page 679 for details on shipping before returns and restocking charges.

- *Priority* sets the opening priority of a call in Call Maintenance. The lower the number, the higher the priority. You can also define the priority for an end user. If you use escalations, they can affect the priority.
- *Hours of coverage* define when you are available to provide service. Call Maintenance uses them to schedule engineers and calculate a call’s next event date and time.
- *Level and limits of coverage* determine the coverage percentage applied by the system and limits based on work code and service category or on invoice sort. You can also specify a total limit and a limit for individual prices.

See “Levels and Limits of Service” on page 170.

- *Charge codes* on the service type provide defaults in Call Activity Recording.

Product Lines and Service Types

The product line ties the service type to a set of general ledger accounts. It usually determines the accounts affected by the sale of contracts and by RMA issues and receipts. In Call Activity Recording, charge codes usually determine product lines. The system references product lines on the service type only if you do not set up charge and revenue product lines.

The system uses a service product line only if Use Item Prod Line in Service Management Control is No. Otherwise, the system uses the item product line.

The product line lets you track and report on contract sales for different contract types. For example, to book the billing of annual contracts to a different GL account than semiannual contracts, you can create service product lines with different sales and sales discount accounts. You can then associate these product lines with different contract types.

When you post an invoice for a contract billing, the system credits the product line sales and sales discount accounts. You can modify accounts line-by-line on a contract if Modify Sales Accounts is Yes in Contract Control.

Automatic Pricing

The price lists you associate with service types support automatic pricing for many service activities. On contract types, you can specify three price lists: contract, call, and RMA credit. On warranty types, you can only specify the first two. Each of these price lists has a different use.

See Chapter 6, “Automatic Pricing,” on page 199 for details on setting up service price lists.

- Contract price lists determine what the system charges the customer for coverage of items on the contract. This determines the amount the customer is invoiced for the contract itself. Invoicing for actual service performed is separate. Define these price lists with Service Pricing Maintenance (11.17.1) as a type C (contract).
- The call price list defaults to contract quotes and contracts that reference a service type. When a call is opened that is covered by the contract, Call Activity Recording (CAR) uses the call price list to determine the price for labor, expenses, and items you use in providing service on a call. The call price list also determines credits for items exchanged in CAR and fixed prices.

  Define these price lists in Service Pricing Maintenance with type R (repair). You can create a type E (expense) list with the same price list code to determine the cost of expenses recorded in CAR.
- RMA credit price lists determine, during the return segment of RMA processing, what the system credits the customer for an item returned. Set up price lists for credits in the PO/RTS/Sched/RMA Rcpt Pricing Menu (1.10.2).

The system handles pricing for RMA issues like sales order pricing. You do not specify a price list; the system determines which price lists apply and calculates a best price based on codes and rules previously set up. For this reason, you do not associate a price list with a service type for RMA issues.

Table 5.1 summarizes which service functions use price lists.

Table 5.1
Price List Usage

Price List	Used In	Defined In
Contract Price List	Contract Maintenance and Invoicing	11.17.1
Call Price List	Call Quote Maintenance, Call Activity Recording, Call Invoice Recording	11.17.1
RMA Credit Price List	RMA Maintenance receipt lines	1.10.2.1
Sales Order Price Lists	RMA Maintenance issue lines	1.10.1.1

Hours of Coverage

Call Maintenance uses coverage hours and response time to calculate the call's next status date and next status time.

Example A service type has these values:

```
Service Response Time:      4 hours
Service Coverage:           Mon - Fri, 08:00 - 17:00
```

You take a call at 16:00 hours on January 3, using this service type. The call event time plus the response time yields a next status time of 20:00 hours. This would create a problem, since the service department is open only until 17:00.

However, the system knows your service coverage hours, so it schedules the next event three hours into the next day you are open for support business. The next status date on the call is January 4, and the next status time 11:00 hours.

Create a different service type for each schedule of coverage your business supports. This enables you to define premium service coverage for critical or special components.

Example A company selling personal computer systems and network hubs wants to provide service coverage for the computers from 10:00 to 17:00 hours. The network hubs are more critical; they need coverage from 06:00 to 20:00 hours. Use one service type for the computer line item and another for the network hub.

Similarly, if you warranty these items, create and apply two warranty codes with different coverage hours.

To provide different coverage levels for the same item at different times of the day, you can add the same item to a contract twice, but only if the service type for the line items differs.

Levels and Limits of Service

The level of service for the warranty, service contract, or default service type carries through into the management of service activity from calls to returns. The level of service determines the percentage paid by the end user for service.

SSM provides flexibility in classifying and supporting service activity. You can define limits either at a high level with invoice sorts, or at a lower level with work codes and service categories. You can also define a total limit amount for all activity.

Limit Usage Restrictions

The implementation of coverage levels and limits depends on the Contract Limits field in Contract Control.

- When this field is No, you cannot define limit amounts on contract types or modify coverage levels in Contract Maintenance.
- When this field is Yes, you can define the limits, copy them into multiple contract levels (header, default item and end user, and detail lines), and modify them.

You define levels of coverage associated with service types the same way whether you are using limit amounts or not. *While you can define limit amounts for a contract type, the system only uses them when you copy them into a contract*.

The contract type provides a template for creating similar contracts. If you use it as a generic service type, the system applies the coverage level percentage of the service type. Limits are only effective in a contract because the system must accumulate and check quantities over time. This is only possible when you can collect and record information for a specific line item.

The system uses limit amounts only with contracts and checks them only in Call Activity Recording. RMA Maintenance applies the coverage percentage only, even if a contract has limit amounts.

In summary, limits:

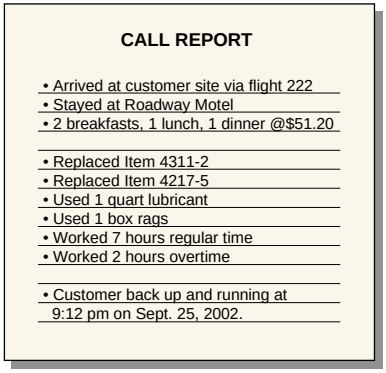
- Can only be used when Contract Limits is Yes in Contract Control
- Cannot be used with warranties
- Can be defined on a contract type, but are only used when copied into a contract
- Are only checked in Call Activity Recording

Understanding Codes for Limits

Before you learn how to define limits, it is important to understand how service codes provide support for defining limits. The system uses three important codes: service categories, invoice sorts, and work codes.

Service categories group the detail you record when you provide service in response to a call. Figure 5.3 illustrates a sample call report.

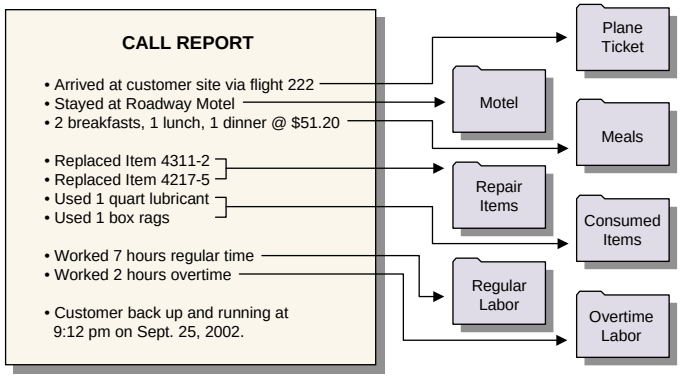
Fig. 5.3
Sample Call Report


CALL REPORT
• Arrived at customer site via flight 222
• Stayed at Roadway Motel
• 2 breakfasts, 1 lunch, 1 dinner @$51.20
• Replaced Item 4311-2
• Replaced Item 4217-5
• Used 1 quart lubricant
• Used 1 box rags
• Worked 7 hours regular time
• Worked 2 hours overtime
• Customer back up and running at 9:12 pm on Sept. 25, 2002.

Each of the details on this report represents an instance of a service category. An organization can have as many or as few service categories as they need.

Figure 5.4 shows how you can categorize each detail of a call with the appropriate service category. Since the service category represents the lowest-level way of grouping detail, it is pictured as a file folder.

Fig. 5.4
Call Details Map to Service Categories


CALL REPORT
• Arrived at customer site via flight 222
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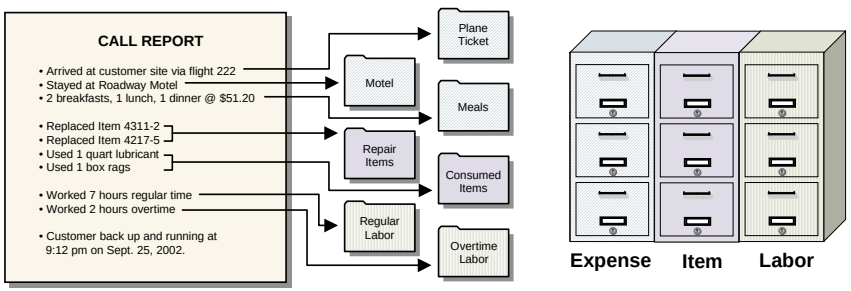
• 2 breakfasts, 1 lunch, 1 dinner @ $51.20
• Replaced Item 4311-2
• Replaced Item 4217-5
• Used 1 quart lubricant
• Used 1 box rags
• Worked 7 hours regular time
• Worked 2 hours overtime
• Customer back up and running at 9:12 pm on Sept. 25, 2002.
Plane Ticket
Motel
Meals
Repair Items
Consumed Items
Regular Labor
Overtime Labor

Each service category is associated with an invoice sort when it is defined. Normally you use three basic invoice sorts: for expenses, items, and labor. Invoice sort codes group all the details of related service categories for high-level presentation.

In Figure 5.5, three file cabinets represent three invoice sorts. The system sorts the detail associated with a particular service category into one of three cabinets: expense, item, or labor. In this example, you can put a related folder in any drawer of the correct filing cabinet.

Fig. 5.5
Invoice Sorts Group Service Categories



You can define generic coverage limits based on invoice sort codes. For example, you can define a simple limit for all expenses. However, you can also consider the work code when defining limits. Work codes group the service detail on a call based on the type of work. Figure 5.6 shows the result of adding three work codes: repair, install, and PM. Now the system sorts detail both by file cabinet and by drawer within the cabinet.

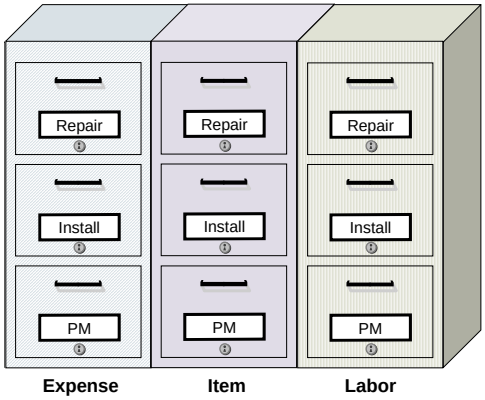


Fig. 5.6
Work Code Adds More Detailed Control

Grouping information this way supports complex limit definitions. In Figure 5.6, the more work codes you use, the more drawers you need in each filing cabinet.

While invoice sorts do not give as much detail, with them you can make generic changes in coverage levels across the customer base or a specific service contract market. Work codes and service categories, on the other hand, provide the power to manage and change service levels in the most detailed situations.

You can combine work codes, service categories, and invoice sorts in almost unlimited ways. For example, you can base limits for service items on the kind of work done, but make limits for expenses generic, based on invoice sort. Or if you do not need detail, you can set up one limit for all the detail recorded.

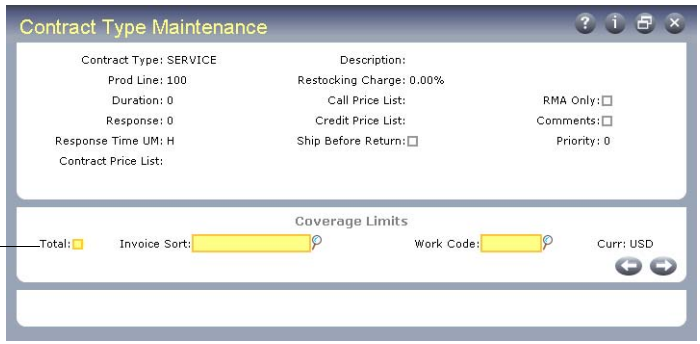
You can use any work code and service category combination except a work code with fixed price set to Yes. You cannot use fixed pricing in conjunction with coverage limits.

Figure 5.7 illustrates the Coverage Limits frame in Contract Type Maintenance. The Total, Invoice Sort, and Work Code fields determine the kind of limit you are defining:

- If Total is Yes, Invoice Sort and Work Code must be blank, and the record limits all service or defines a generic level of coverage.
- If Total is No and you enter an Invoice Sort value, the system applies this limit to the service categories associated with the specified invoice sort.

- If Total is No and you specify a Work Code, you must also specify a service category. The limit applies only to the specified combination of work code and service category.

Fig. 5.7
Invoice Sort or Work Code



You can define any number of limits. The system uses limits for a work code and service category combination first. If it finds none, it uses those set up for invoice sorts, then those for the total. When you define limit amounts in a contract, the system always looks for a total limit amount to use in conjunction with the lower-level amounts.

Simple or Complex

Work codes and service categories enable you to track service activity in detail, but the detail introduces complexity into the rest of Service/ Support Management, including implementation.

Tip
To clarify your setup, use charts like the one on page 177.

If you use work code and service category details in coverage, create clear policies on how to use the service types as templates for contracts. Without careful planning and implementation, it becomes easy to lose control of coverage limits and service costs.

Service Levels by Invoice Sort

If you are not concerned about tracking coverage, percentage, or monetary limits by specific service category, the high-level invoice sort is the best solution. If you choose to cover only preventive maintenance labor and bill for everything else, use the work code and service category scheme to track labor against service limits.

The invoice sort tracks service activity at a high level by grouping labor, expenses, and items used for related service categories.

See “Invoice Sort Codes” on page 85.

Invoice Sort Example

A service organization’s engineers perform 17 kinds of labor. These labor types correspond to various skill and job classifications and overtime procedures, distinctions that reflect different service pricing. However, contractual agreements cover labor at the same level regardless of its type. So this organization bases its levels of coverage on a labor invoice sort. To do this, they follow these steps:

1. Create the labor invoice sort with Invoice Sort Maintenance.
2. Define a service category for each kind of labor with Service Category Maintenance. Each of these service categories references the labor invoice sort code.
3. Define service limits in terms of the labor invoice sort.

Using this approach, labor consumption receives one level of coverage, regardless of what kind of labor it is.

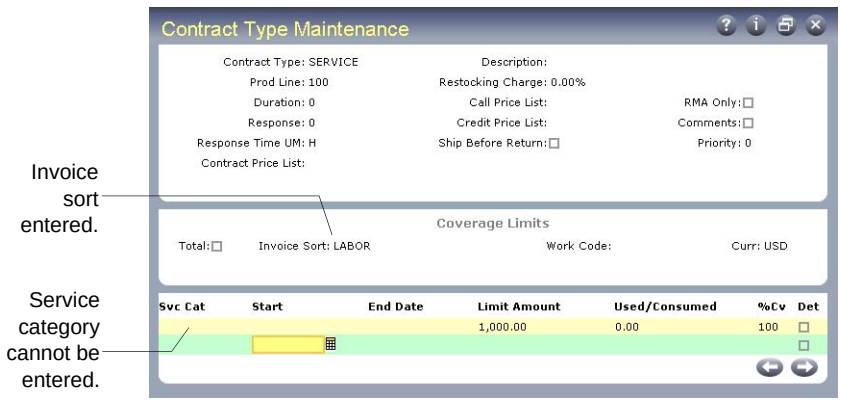


Fig. 5.8 Service Limits by Invoice Sort

To define limits by invoice sort, you enter an appropriate sort code. In this case, you cannot enter anything for service category (Svc Cat). The coverage level (%Cv) is defined as a percentage. In Figure 5.8, the price of labor is covered at 100 percent up to the limit amount of $1000.00. This means the contract covers the first $1000.00 of labor, regardless of the work code and service category combinations.

Call Activity Recording checks service limits when a service contract provides coverage. Since you set up limits at the invoice sort level, CAR allows $1000.00 for all service categories with the labor invoice sort, regardless of the work code. The system accumulates the charges on service contracts based on this contract type and compares them with this preset limit.

You can use invoice sorts to set up similar limits for expenses or items.

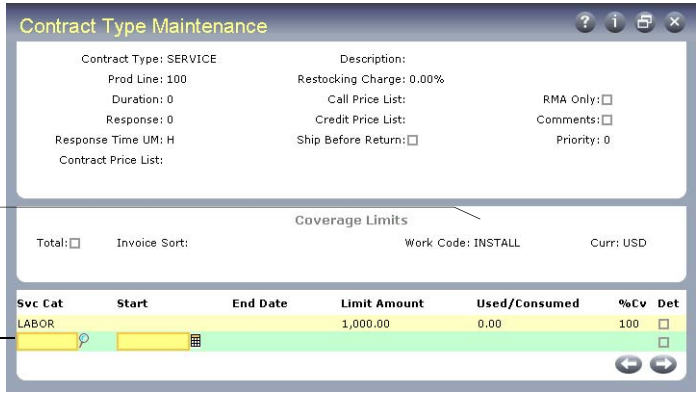
Service Levels by Work Code and Service Category

The invoice sort works at a high level. For more detailed tracking of service limits and percentage of coverage, use work codes and service categories, as shown in Figure 5.9. In this approach, you create a relationship between a work code and service category. The system then tracks service limits based on the kind of work done.

This approach is useful for a service organization that covers only certain kinds of activity. A contract for preventive maintenance, for example, may only cover PM labor and bill for other kinds. Or an organization may choose to cover repairs at 100 percent, PM at 50 percent, and installation not at all.

SSM can track service limits against any work code and service category combination.

Fig. 5.9
Service Limits by Work Code and Service Category



To define limits for a work code, Total must be No and Invoice Sort must be blank. When you enter a work code, you must enter a service category to further qualify coverage limits.

Example

A service organization performs three different kinds of work. They define three work codes representing them: REPAIR for repairs, INST for installation, and PM for preventive maintenance.

They also set up three service categories: Labor1 for labor, Item1 for items, and Expense1 for expenses. Now they can set up different levels of coverage for each kind of work for labor hours, items consumed, and expenses. Table 5.2 shows the basic scheme for these work code and service category combinations.

Table 5.2 Sample Work Code and Service Category Combinations

	Work Codes		
	REPAIR	**INST**	**PM**
Service Categories	Labor1	Labor1	Labor1
	Item1	Item1	Item1
	Expense1	Expense1	Expense1

You can define different coverage percentages and limit amounts for each service category under a work code. For example, for the REPAIR work code, you define:

- 100% coverage up to $1,000 for the Labor1 service category
- 75% coverage up to $750 for the Item1 service category
- 50% coverage up to $500 for the Expense1 service category

Using these definitions, Table 5.3 defines a grid of sample work code and service category combinations.

Table 5.3 Limits by Work Code and Service Category

			Work Codes		
			REPAIR	**INST**	**PM**
Service Categories	Labor1	(%)	100	100	100
		limit ($)	1,000	2,000	1,000
	Item1	(%)	75	50	100
		limit ($)	750	500	750
	Expense1	(%)	50	0	100
		limit ($)	500	0	500

Defining Service Levels with Effective Dates

Effective dates are another important element of service levels you can define. Effective dates add a layer of differentiation to limits. You can use them with limits set up for invoice sorts or for limits that apply to work code and service category combinations.

The system uses effective dates on limits the same way it uses effective dates in other functions, with some exceptions. Similarities and differences are noted in the following sections.

Open-Ended Dates

If you leave a start or end date blank, the system, as usual, assumes the date is open ended and coverage is in effect from the beginning of time or to the end of time.

Overlapping Dates Restricted

Unlike dates in other parts of the system, effective dates for limits cannot overlap. Since you can accumulate amounts against limits when you copy them into a contract, there can be only one valid set of limits at any one point in time. Otherwise, the system would not know where to post the consumed amounts.

Since the system considers a limit with a blank start and end date always in effect, you cannot create such a limit and then create another with specific start and end dates.

Copying Effective Dates into Contracts

When you copy limits into a contract, the system sets the earliest start date to the contract start date and the last effective date to the contract end date.

In a simple case, you can set up limits on a contract type without any effective dates, then create a contract based on that contract type. The contract start date is 01/01/02 and end date is 12/31/02. When you copy limits into the contract, the starting effective date is 01/01/02, the end effective date 12/31/02.

Now consider what happens if you have two sets of limits on the contract type with the following effective dates:

06/30/01 – 06/30/02

07/01/02 – 06/30/03

The same contract from 01/01/02 and 12/31/02 still has two sets of limits, but the system copies them in with these dates:

01/01/02 – 06/30/02

07/01/02 – 12/31/02

Effective Dates and Contract Renewal

How you set up effective dates on contract types can affect contract renewal. When you create a contract, you can tell the system to copy limits from the contract or from the contract type. If you set up limits with consecutive effective dates and tell the system to refer to the contract type, the system brings in the limits effective for the renewed contract's start date.

This way you can phase in changes and the system applies them during contract renewal.

Applying Effective Dates

Call Activity Recording uses the call open date when it looks for coverage limits. Remember this if you add lines to an open call. The system bases the limits it applies to that line on the date you opened the call, not the date you added the line. The call open date also determines limits during invoicing.

Note When Multiple Time Zones is active, the call open date is relative to the time zone of the call's end user.

See Chapter 4, "Multiple Time Zones," for details on the effect of MTZ.

Effective Dates: Example 1

Table 5.4 illustrates sample limits based on the data in Table 5.3. However, a new row for effective dates has been added to the table. To make this example simple, dates are blank for all the limits. This means each service category is effective all the time.

Table 5.4
Work Code/Service Categories with Blank Dates

			Work Codes		
			REPAIR	**INST**	**PM**
Service Categories	Labor1	Dates	(blank)	(blank)	(blank)
		%	100	100	100
		Limit ($)	1,000	2,000	1,000
	Item1	Dates	(blank)	(blank)	(blank)
		%	75	50	100
		Limit ($)	750	500	750
	Expense1	Dates	(blank)	(blank)	(blank)
		%	50	0	100
		Limit ($)	500	0	500

The coverage defined in this table continues forever, or until superseded by another contract. In this case, the service categories are not controlling coverage periods in the contract; they are controlling only the percent of coverage and the limits.

Effective Dates: Example 2

You can define coverage effective dates, percentages, and limit amounts for each service category under a work code.

Table 5.5 illustrates limit data for two years. You might use a contract type like this for a two-year contract or to have the system apply next year’s limits when this year’s contract expires.

Table 5.5 Work Code and Service Categories with Non-blank Dates

			Work Codes		
			REPAIR	**INST**	**PM**
Service Categories	Labor1	Dates	1/02 - 12/02	1/02 - 12/02	1/02 - 12/02
		%	100	100	100
		Limit ($)	1,000	2,000	1,000
		Dates	1/03 - 12/03	1/03 - 12/03	1/03 - 12/03
		%	75	75	75
		Limit ($)	1,000	2,000	1,000
	Item1	Dates	1/02 - 12/02	1/02 - 12/02	1/02 - 12/02
		%	75	50	100
		Limit ($)	750	500	750
		Dates	1/03 - 12/03	1/03 - 12/03	1/03 - 12/03
		%	50	25	75
		Limit ($)	500	250	500
	Expense1	Dates	1/02 - 12/02	1/02 - 12/02	1/02 - 12/02
		%	50	0	100
		Limit ($)	500	0	500
		Dates	1/03 - 12/03	1/03 - 12/03	1/03 - 12/03
		%	50	0	75
		Limit ($)	500	0	250

In this example, preventive maintenance coverage for each service category starts at 100%. The second year it is 75%. While these factors are the same for the PM work code and each service category, the actual monetary limit varies.

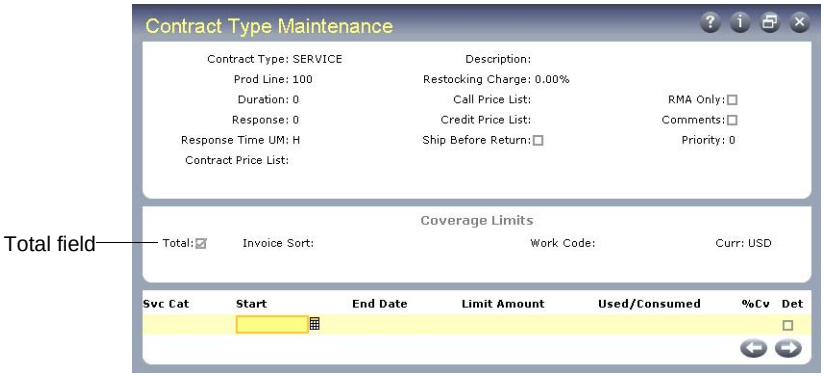
This kind of table helps you set up work codes and service categories. For each work code, you can enter any number of time periods, percentages, and limit amounts for a service category, to match your business. For Labor1, for example, you can set up a series of coverage periods for preventive maintenance.

Defining Service Levels with a Total Service Limit

In Contract Type Maintenance, Total is the first field in the Coverage Limits frame, illustrated in Figure 5.10. This field does two things:

- If lower-level limits exist, Total determines an aggregate amount applied to the cumulative total consumed for all service limits. The system applies this feature only when you copy limits into a contract.
- It enables you to set up a generic record for the system to use when more specific records do not exist.

Fig. 5.10
Total Field in Contract Type Maintenance



To define a total limit, Invoice Sort and Work Code must be blank. The system uses the limit data if there are no other limits; you can set up simple, high-level, generic limits. For example, a contract type covers service activity at 50% up to 10,000. This record then applies to any kind of activity in Call Activity Recording.

When you define a total amount in addition to other more detailed records, the system uses it in conjunction with the other limits. For example, an invoice sort for labor has a $1,000 limit. Another invoice sort for items has a $1,000 limit. But you want an overall service limit of $1,500. The value in the Amount field when Total is Yes determines an aggregate limit for coverage.

When you record service in CAR for an item under an active contract with this service type, the system compares service activity against this total to see if service is over limit. The system still tracks costs against the invoice sort or work code and service category combination as appropriate. However, when you enter a value and Total is Yes, the system also compares the total service costs against this aggregate limit.

Example Three limit records have a $750 limit for labor, items, and expense invoice sorts. You set an aggregate service limit of $1,500. You take the calls in Table 5.6 and record the activity.

Table 5.6 Sample Call Information

Call	Labor	Items	Expenses	Accumulated Total
CA1	500	300	200	1000
CA2	200	300	100	600
Invoice Sort Total	700	600	300	1600

Even though the amount recorded is under the $750 limit amount for each invoice sort, the $100 of expenses for CA2 is not covered, since it exceeds the total limit of $1500.

When you specify an amount with Total set to Yes and the aggregate reaches $1,500, this item is over its service limit regardless of the limits on individual invoice sorts or service categories. The servicing company has now met its contractual requirements and the system applies the over-limit charge code to service activity.

Defining Percent of Coverage

You can use the percentage amount in the %Cv field by itself or in conjunction with limit amounts. If Contract Limits is No in Contract Control, the coverage percent determines coverage. This is also the case when a contract type rather than an actual contract provides coverage. The system checks limit amounts only on contracts.

The coverage percent by itself determines the amount covered according to the following formula:

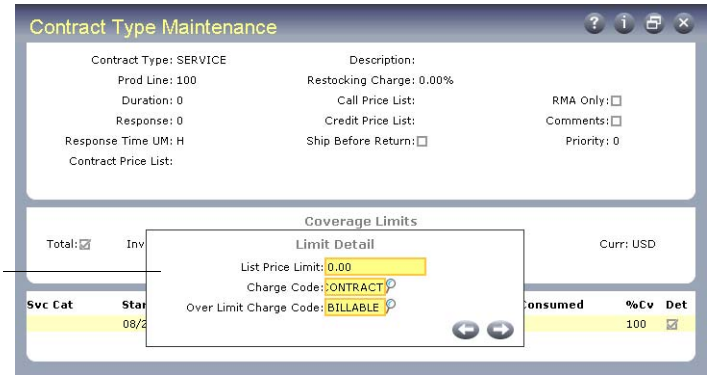
*Price * Coverage Percent = Covered Amount*

For RMA issues, the system uses the coverage percent to calculate the price discount percent, since the limit features of contracts do not apply to RMAs. Coverage percent is also the only factor the system considers for warranty coverage in RMAs and calls.

Defining Limit Detail

If you specify Yes to the Detail field when defining limits, an additional limit detail pop-up displays, as in Figure 5.11.

Fig. 5.11
Limit Detail Pop-Up



Limit detail provides even more control over how the system applies coverage.

The system searches for limit details in the same way it searches for limits. First it looks for a work code and service category combination, then for limits by invoice sort, and finally for limits in the Total = Yes record.

List Price Limits

Tip
If you use common limit detail for the limits on a service type, specify values for the Total = Yes record only to simplify data entry.

A list price limit defines a ceiling on the price of individual items covered by the service type. When you specify an amount in List Price Limit and the list price of a particular item exceeds this amount in Call Activity Recording, the item is not covered even if limits have not yet been consumed. The system suggests the over-limit charge code.

Note Overriding the billable charge code has no effect on the covered amount for an item that exceeds the list price limit. The covered amount always defaults to zero, but you can change it.

Under-Limit Charge Code

You can associate two charge codes with each limit record: an under-limit and over-limit charge code. These charge codes direct financial impacts to charge product lines in Call Activity Recording. If you do not specify charge codes for detailed limits, the system looks for charge codes associated with the Total = Yes record. If none exist there, the system uses default charge codes defined with Default Charge Code Maintenance.

On a contract type, use a charge code with either contract or covered set to Yes for the under-limit charge code. Similarly, for a warranty, use a charge code with warranty or covered set to Yes.

However, use covered charge codes carefully. They are intended to indicate a generic coverage, such as that provided by the Default Call Service Type in Call Management Control. You can also set up generic service types for special purposes in call management.

Important *Never* use the covered charge code on service types that form the basis of contracts and warranties.

Contract and Warranty Type Maintenance warns you that covered is reserved. Disregarding this warning can lead to confusion when you use the service type in Call Activity Recording.

See “Charge Codes” on page 103 and “Calculating Coverage in CAR” on page 449.

Over-Limit Charge Code

The Over Limit Charge Code field determines the default charge code in Call Activity Recording when service costs exceed the service limit. Use a charge code with Billable set to Yes in Charge Code Maintenance.

When service charges exceed the limit, CAR switches to the over-limit charge code. If you do not associate an over-limit charge code with the limits, the system uses the billable charge code in Default Charge Code Maintenance instead. You can override the billable charge code with a giveaway charge code in particular instances in CAR.

Over-limit charge codes have an effect in two cases:

- On a contract with limit amounts. Charges accumulate against a limit amount only on a contract.
- On a contract or warranty if the coverage percent is zero. In this case, all service is over the limit.

Limits at Multiple Levels

See “Limits at Multiple Levels” on page 241 for details.

The contract type is a template for building service contracts. If Contract Limits is Yes in Contract Control, you can further refine or customize the limit template at the contract level, for end users or default items, and on individual lines within the contract.

This topic is discussed in detail in Chapter 8.

No Coverage or Zero Percent Coverage

Because of the way the system looks for limits, defining a limit record with zero percent coverage can have a slightly different effect than not defining any coverage.

If you define a record with zero coverage, you have more control over the charge codes the system suggests in Call Activity Recording. In this case, the system suggests the over-limit charge code associated with the record.

If no record exists, the system suggests the billable charge code in Default Charge Code Maintenance.

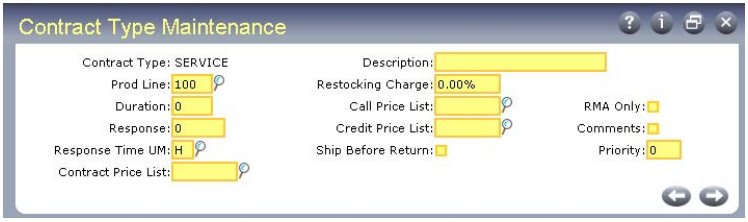
Contract Type Maintenance

This section provides a field reference to Contract Type Maintenance (11.5.10).

Header Frame

Many important features that determine coverage display in the Contract Type Maintenance header.

Fig. 5.12
Contract Type Maintenance Header Frame (11.5.10)



Contract Type and Description. Enter a code to uniquely define this contract type and a brief description. The description appears in the lookup that displays when you select service types.

Prod Line. The product line relates the service type to a set of general ledger accounts. Whether the system uses this product line depends on Use Item Prod Line in Service Management Control. If this is No, the system uses the product line of the service type in effect; otherwise, the item product line.

When you post a contract invoice, the system credits the product line Sales and Sales Discount account. You can modify accounts on contract lines if Modify Sales Accounts is Yes in Contract Control.

You can also use the product line of the service type in Call Activity Recording. If the system finds no charge or revenue product line for service activity and Use Item Prod Line in Service Management Control is No, the system uses the product line of the service type in effect.

Duration. Duration defines the default length of a contract. In service contract types, the duration is in months, while in warranties, the duration is in days. In contracts, the system calculates the contract end date by adding the duration of the service type to the contract start date.

Response and Response Time UM. A response time states the length of time and its unit of measure within which your service department should respond to a call. The response time must be expressed in integer values. A response time of up to 168 hours (1 week) can be specified. After that, the unit of measure must be days.

Tip
The response unit can be minutes, hours, or days.

If you are not using an escalation sequence, Call Maintenance uses the response time to calculate the Next Status Date and Time values according to the following rule:

Next Status Date/Time = (Event Date/Time) + Response Time

For example, a call has a service type with the following characteristics:

Response:	3
Response UM:	H
Coverage Days:	M-F
Coverage Hours:	08:00 - 17:00

For this service type, you expect to respond within three hours of taking the call. It also means you provide this service only Monday through Friday, 8:00 AM to 5:00 PM.

Contract Price List. Enter a valid contract price list defined in Service Pricing Maintenance (11.17.1). The system uses this price list as the default price list code for contract quotes and contracts based on this service type. It determines what to charge the customer for coverage of items on the contract.

The contract price determines the amount the customer is invoiced for the contract itself. Invoicing for service activity is separate.

Restocking Charge. The restocking charge is a percentage deducted from the credit price of a returned item on an RMA. Customers can perceive restocking charges as penalties, but you might apply them to cover the labor and expense of refurbishing and repackaging returned items.

Call Price List. Enter a valid repair price list defined in Service Pricing Maintenance (11.17.1). The call price list sets the default for the same field in Contract Quote Maintenance and Contract Maintenance. The system uses the price list from the contract as the default in Call Quote Maintenance and CAR for calls covered by contracts that reference this service type.

Note If the service type is used to provide coverage directly, such as the default call service type in Call Management Control, the call price list is referenced directly from the service type.

Repair price lists can specify prices for items consumed in a service activity and labor and expenses recorded in CAR. The call price list also determines credits for items exchanged in CAR, using the Exchange UM value from Call Management Control, and fixed prices using the Fixed Price UM value.

If you set up an expense cost price list with the same code as the call price list, Call Activity Recording uses it to determine standard costs for expense items.

Credit Price List. During the receipt segment of RMA processing, the system uses the credit price list you assign to the service type to determine the credit amount for a returned item. If you define a restocking charge on the service type, the system reduces the credit price by that percentage.

Tip
Set up RMA credit price lists in the PO/RTS/Sched/ RMA Receipt Pricing menu (1.10.2).

Ship Before Return. This field affects processing of linked RMA receipt and shipment lines.

No: You process the receipt of a defective item before you can issue a replacement. You can print a packing list, but you cannot ship the replacement item.

Yes: You can issue replacement items regardless of the number of items received.

RMA Only. A reference-only field that indicates whether this service type is exclusively for processing RMAs.

Comments. Indicates whether you want to enter transaction comments for this service type.

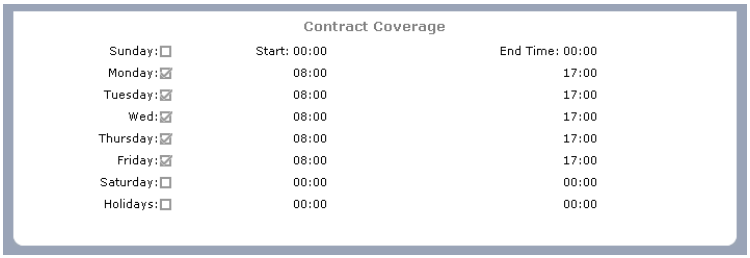
Priority. The Priority field sets the opening priority of calls in Call Maintenance. The lower the number, the higher the priority. For example, a call with a priority of 1 is more urgent than a priority 50 call.

You can also assign call priority by end user in End User Address Maintenance (11.9.1). The system uses any nonzero call priority on an end user's record instead of the service type. You can also set call priority in Service/Support User Preferences. Escalation sequences can affect call priorities.

Service Coverage Frame

Once you define the header information for the service type, you can specify the days and hours of coverage.

Fig. 5.13
Contract Coverage Frame



Tip
To indicate 24-hour coverage, enter a range of 00:00 to 23:59. In most processor time clocks, 00:00 is the same as 24:00.

The service coverage schedule defines the days and hours you provide service, according to a 24-hour clock. To define coverage from 8:00 AM until 5:00 PM, you create a service contract type that has service coverage starting at 08:00 and ending at 17:00 hours. To indicate no coverage, enter a range of 00:00 to 00:00.

Call Maintenance uses service coverage in conjunction with Response Time to schedule the call's next status date and next status time.

Coverage Limits Frame

Specify coverage limits in one of three ways:

1. Set Total to Yes to specify a total amount covered.
2. Enter a value in the Invoice Sort field to specify limits for a particular invoice sort.
3. Enter a value in the Work Code field to specify limits for a work code and service category combination.

You can enter a value in only one of these three fields at a time. Typically, a service organization chooses to track costs by invoice sort or by work code and service category, although it is possible to combine the two methods.

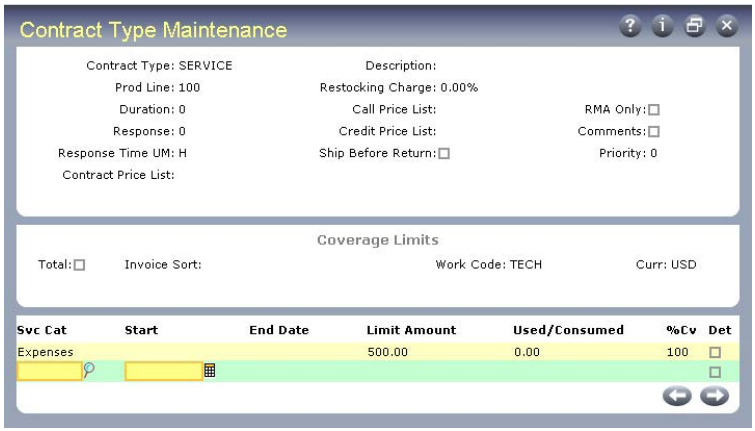


Fig. 5.14
Coverage Limits Frame

Total. If Yes, the value in the Amount column defines a limit to charges accumulated on a contract using this service type. The percentage of coverage and other data apply as a generic record when no other applicable record exists.

Invoice Sort. If you specify a value here, the limit data applies to this invoice sort. A value in the Amount column indicates a total for the service categories associated with this invoice sort, regardless of the work code.

Work Code. If you specify a value here, also specify a service category. Use any work code except a work code with fixed price set to Yes. The associated limit data applies to this work code and service category combination.

Curr. For contract types and warranties, the system base currency displays. For contracts, the contract currency displays. The system converts the amounts from base currency to contract currency.

Svc Cat. Specify a service category when you enter a work code in the previous frame. The associated limit data applies to this work code and service category combination.

Start and End Date. Determines the effective period for these service limits. One or both dates can be blank, in which case the system considers the limits open ended. The system prevents you from creating overlapping effective dates.

Amount. A value expressed in the system base currency indicating a preset limit on coverage. You cannot update this field if Contract Limits is No in Contract Control.

Used/Consumed. Display-only field that is not used for contract and warranty types. When limits are consumed on an actual contract, the amount posted against that limit (consumed), or recorded in Call Activity Recording (used), displays in this field.

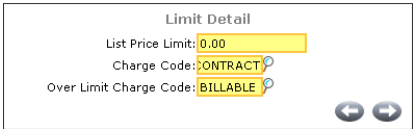
%Cv. The coverage percent determines how much of a particular charge is covered and how much you can invoice. If labor costs $200 dollars and %Cv is 75%, $150 is covered and the system applies it to any limit.

Det. Indicates whether the Limit Detail pop-up window displays.

Limit Detail Frame

When Det is Yes, a pop-up for limit detail appears.

Fig. 5.15
Limit Detail Pop-Up



The fields in the Limit Detail frame are optional.

List Price Limit. If you specify an amount in this field and record an item or service category with a price exceeding this amount in Call Activity Recording, the item is not covered even if limits have not yet been consumed. Coverage always defaults to zero for such an item, regardless of charge code.

Tip
If you do not associate a charge code with the limits, the system uses the default Contract or Warranty charge code from Default Charge Code Maintenance.

Charge Code. Charge Code determines the charge code Call Activity Recording uses when services are within the service limit. The code in Contract Type Maintenance normally has Contract set to Yes in Charge Code Maintenance. In Warranty Type Maintenance, it normally has Warranty set to Yes.

When service charges on a contract exceed the limit or 0% coverage is defined, the system switches the code in CAR to the over-limit charge code.

You can also specify a charge code with Covered set to Yes for the under-limit charge code. However, limit its use to service types that provide generic coverage, such as the call default service type in Call Management Control.

Important *Never* specify a covered charge code on any service type that is the basis of a contract or warranty.

Over Limit Charge Code. Determines the charge code Call Activity Recording uses when service costs exceed the service limit. This charge code must have the Billable field set to Yes in Charge Code Maintenance.

If you do not associate an over-limit charge code with the limits, the system uses the billable charge code in Default Charge Code Maintenance instead. You can override the billable charge code with a giveaway charge code in particular instances in CAR.

Warranty Types

You have probably seen statements like "...backed by a 90-day warranty on parts and labor" in advertisements or sales brochures. A warranty is an agreement between you and your customer that says you will provide a certain level of service for an item from the date of purchase through a specified warranty period, usually measured in days.

Many customers base purchasing decisions on the terms and conditions of a product's warranty. In this sense, the warranty is a feature of the product or item. Similarly, Service/Support Management treats a warranty as a part of the item and keeps the warranty information in the installed base record. The system can record this warranty information in the installed base when you ship a warranted item.

Important If you plan to use warranties, you must maintain the installed base.

See Chapter 2, "Installed Base," on page 19.

What Is a Warranty?

A warranty is a promise that the selling company takes responsibility for the repair or replacement of an item under the stated conditions. Warranties specify exact terms, conditions, coverage percentages, and time limits.

The levels of coverage you define for a warranty influence Service/Support Management functions dealing with the repair, maintenance, and replacement of warranted items. The warranty type, which you associate with the item in Service Item Maintenance (11.3.7), determines the warranty conditions.

You can attach a warranty to each installed base record. In this way, many items can have the same warranty code or type of warranty, yet have warranties that differ (for example, different expiration dates). This enables you to maintain different kinds of warranties in a central location and tailor warranties to specific customers.

Warranties affect Call Maintenance, RMA Maintenance, and Call Activity Recording. The warranty information is used when these functions refer to an item in the installed base.

Setting Up Warranties in the Installed Base

In SSM, you give the warranty type a code to identify it and then define it. You then assign the warranty to items in Service Item Maintenance (11.3.7).

If you are using the interface between sales orders and service that supports automatic updating of the installed base, the system uses the default warranty when you add an item to the installed base. Coverage begins on the ship date. If SO Edit ISB Defaults is Yes in Sales Order Control, you can change the warranty type before the system creates the installed base record.

When warranty coverage information is associated with installed base items, it is also available to other service functions. The warranty is specific to an installed base record.

Table 5.7 summarizes setting up warranty codes.

Table 5.7 Setting Up Warranty Codes

Function	Action
11.24	Set Ship to Installed Base to Yes.
11.3.15	Define warranty type.
11.3.7	Attach warranty type to item and set Installed Base to Yes.
11.3.1	Create installed base record manually.
7.13.4	Create installed base record automatically by posting invoice for sales order.

Tailoring Warranties by Type of User

Contract types are the bases of contracts, which are unique documents for one end user. Warranties are more general than contracts, but you can tailor them somewhat, based on the end-user type code.

For example, your standard 90-day warranty may not specify a restocking charge. However, for items sold to OEMs (original equipment manufacturers), a restocking charge is required.

To set up warranties for types of end users, follow these steps:

1. To tailor warranties by end-user type, first set up type codes in Generalized Codes Maintenance for field eu_type.
2. Associate the proper type code with end users in End User Address Maintenance.
3. Create a base warranty with a blank end-user type code.

   A warranty with a blank end-user type must exist before you can create one for a particular type of end user. This warranty is a *base warranty.* The base warranty can be a template when creating unique versions.
4. Create a second warranty with the warranty code in step 3 for a specific end-user type.

   The warranty header fields default from the base warranty, and you can modify them.
5. Set up limits for the tailored warranty.

When you create limits for the second warranty, the system prompts you to copy base warranty limits. You can copy and start with these, or create limits unique to this warranty.

Now, when you add an item to the installed base for an end user with the type on the second warranty, the system uses the tailored terms and conditions, rather than the base ones.

Warranty Coverage Levels

You set up levels of coverage for warranties in the same way as for contract types. You can track coverage at the high-level invoice sort level, or using detailed work code and service category combinations. However, you cannot define limit amounts for warranties, since the system does not support an accumulation of amounts against a limit.

See “Charge Codes” on page 103.

If you specify under- and over-limit charge codes on a warranty type, define the under-limit charge code in Charge Code Maintenance with Warranty set to Yes.

Deleting Warranties

The system checks a number of conditions before it lets you delete a warranty:

- You cannot delete a warranty with a blank end-user type code if other warranties based on it exist. These have the same code and a non-blank end-user type
- You cannot delete a warranty with a blank end-user type if it is associated with an item in Service Item Maintenance. You can, however, delete a warranty with a non-blank end-user type code under the same condition.

Warranty Effects

Warranty coverage affects processing in most major service functions including Call Maintenance, Call Activity Recording, and RMA Maintenance.

Call Maintenance

Warranty information is immediately available when you create a call referencing an item in the installed base. Call Maintenance displays the type of warranty and its duration so the service engineer and the customer know if the warranty is in effect. If the warranty is active, it determines the initial setting for the call's response time and may determine priority, if other defaults do not.

Response time is the time within which you should take action on the call. This action could be to assign an engineer or change the call's status and queue. The system uses the response time to calculate initial settings for the next status date and time fields if you are not using call escalation.

Priority is a rating used by the call queue and call escalation managers to select calls with identical Type, Problem, Severity, and Status settings.

Other settings can override the warranty's initial call Response Time and Priority values. Priority can default from the end user if it is defined there. The response time can default from the initial setting in a call escalation sequence and be updated accordingly if you are using call escalation.

Call Activity Recording

The coverage levels for a warranty type determine the coverage for labor, expenses, and items in Call Activity Recording. This, in turn, determines the billable totals on the call invoice. If you associate under-limit and over-limit charge codes with the warranty limits, the system uses them by default in CAR.

RMA Maintenance

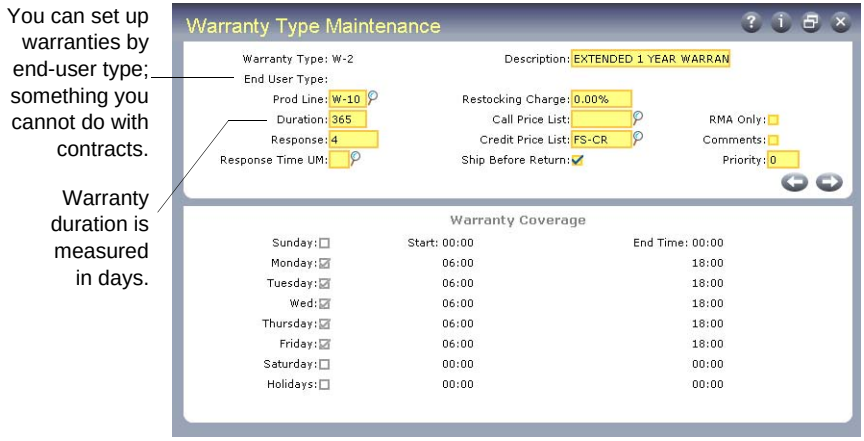
The percentage of coverage on a warranty type determines the discount percent in RMA Maintenance, which determines the billable totals on the RMA sales order and invoice.

Like contract types, the warranty type supplies defaults for the RMA credit price list and restocking charge, and determines if you can process RMA issues before receipts. You can set up Service Management Control to have the system use warranty product lines.

Warranty Type Maintenance

Warranty Type Maintenance (11.3.15) is almost identical to Contract Type Maintenance. The fields that are different are described here: End User Type and Duration. You cannot specify a contract price list for warranty types.

Fig. 5.16
Warranty Type Maintenance (11.3.15)



Tip
To standardize usage, set up end-user type codes in Generalized Codes Maintenance for field eu_type.

End User Type. An optional code to group end users according to categories you define. You can base warranty types on the end-user type. You might have one warranty for OEMs and another for distributors. You cannot specify an end-user type code if a version of the warranty with a blank type code does not already exist.

Duration. Duration defines the default length of a warranty. In service contract types, the duration is measured in months; in warranties, the duration is measured in days. In the installed base, the system uses warranty duration to calculate a warranty expiration date.

Amount. On contract types, this field defines a value expressed in the system base currency indicating a limit on coverage. You cannot update this field in Warranty Type Maintenance.

Chapter 6

Automatic Pricing

You can define more than one kind of price list in QAD 2007. This chapter discusses the price lists you set up in the SSM module, which supports features unique to service. Service price lists are for contracts; for items, labor, and expenses recorded in Call Activity Recording (CAR); and for expense costs in CAR.

Service price lists also support fixed repair pricing and credit you offer customers for reusable components they return during service activity.

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Contract Price Lists **204**

Repair Price Lists **206**

Expense Cost Lists **211**

Field Validations **212**

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Service Price List Copy **217**

Other QAD 2007 Pricing

You can define two kinds of price lists using the Price List and Discount Menu (1.10). Each price list structure applies to different functions. For complete information about setting up and using these pricing structures, refer to *User Guide Volume 6: Master Data*.

SO/SQ/RMA Issues Pricing Menu

The price lists you define from the SO/SQ/RMA Issues Pricing Menu (1.10.1) determine prices in sales quote and sales order maintenance functions. These price lists take advantage of a sophisticated coding schema that enables the system to determine best prices based on predefined rules.

In the service module, RMA issues are similar to sales orders. When you issue an item on an RMA, the system searches for a price just as it would search if you sold the item on a sales order. When it finds the price, it applies the coverage percent of the warranty, contract, or service type on the RMA to the price.

PO/RTS/Sched/RMA Credit Pricing Menu

You define pricing structures for other functions from the PO/RTS/Sched/RMA Receipt Pricing Menu (1.10.2). Purchase orders and scheduled sales orders use these pricing structures, as do two service functions: returns to suppliers (RTS) and RMA Receipts.

An RTS is a kind of purchase order. Since you are returning an item to the supplier where you purchased it, the same purchase order pricing algorithm determines pricing on an RTS.

The credit for a returned item does not necessarily have a direct connection to its original sales price. The credit price also does not require the advanced features of sales order pricing. For example, it would not make sense for the system to look for a best credit for a returned item. For this reason, you define RMA credit price lists like purchase order price lists.

Service Price Lists

Service price lists help you to automate pricing for two service areas: contracts and Call Activity Recording. Automated pricing streamlines management of the financial side of service activity. You can change the prices the system suggests. However, to prevent arbitrary changes, you can set up field security on pricing fields.

Implementation Issues

You can set up service price lists in several ways. One way may be more or less suitable, depending on your business practices. Some of the issues to consider in setting up price lists include:

- Should price lists be for individual items or based on some kind of item grouping?
- Should prices be the same no matter what kind of work is involved?
- Are fixed prices and exchange prices needed?
- When should prices be effective?

Service price lists enable you to embed the special codes related to service activity in your pricing structure. You can base prices on work code, service group, and service category.

Common Attributes of Price Lists

Service price lists are similar to the item price lists in the Price List and Discount Menu (1.10). Create and maintain them in Service Pricing Maintenance (11.17.1) or Service Price List Copy (11.17.4).

While service price lists are similar to other price lists the system uses, there are some important differences.

- *Service Attributes*. Service price lists can indicate special service attributes: work code, service group, and service category. This enables you to tailor them to service needs.
- *Price List Type*. When you create a service price list, you select a price list type (C, R, or E). These types have special meaning in service activities. Type C is for contracts, type R for repairs in Call Activity Recording (CAR), and type E for expense costs in CAR.

Each price list type is discussed individually in:

- “Contract Price Lists” on page 204
- “Repair Price Lists” on page 206
- “Expense Cost Lists” on page 211

Some aspects of pricing are common to all types and are discussed first.

Effective Dates

You can specify start and end effective dates when you set up price lists. Effective dates enable you to set up prices ahead of time and phase them in when appropriate.

When the system searches for a valid price list, it compares the transaction date with the price list start and expiration dates. The price list is valid if the transaction date falls on or between the effective dates. If the system finds more than one valid price list, it selects the one with the latest start date that has not expired.

If you use price lists with open-ended dates together with price lists that use start and end dates, you can get unexpected results. The system selects price lists with open-ended dates first. Instead of open-ended dates, set dates beyond the range of expected business operations with a start date of 1/1/1950 and end date of 12/31/2999.

Currency

You can base price lists on a currency. The system uses a price list only if the currency on the contract or call is the same as the price list currency. If it finds no price list with the correct currency, the price defaults to zero.

Define each customer with the appropriate currency. Currency on a contract or call normally defaults from the customer associated with the end user.

You can create price lists in different currencies using Service Price List Copy. This program enables you to quickly create alternate price lists from one base price list, automatically recalculating prices based on a currency conversion factor.

Units of Measure

The system checks units of measure only for items on contracts and items consumed during service recorded in Call Activity Recording. For the system to use a price list, the UM of the item it is pricing must match the UM on the price list. This enables you to set up different prices depending on the unit of measure of the activity. For example, you can offer a lower price when a case of fluid is consumed than when an individual unit is consumed.

See “Service Units of Measure” on page 207 for information on special service units of measure.

Amount Types

Service price lists support three of the amount types other pricing structures use. The amount type determines the way the system calculates the price.

- *Discount %*. Discounts are percentages the system takes from the item list price in the item master.
- *Markup %*. Markups are percentages the system adds to the item GL cost at the relevant site.
- *Price*. A type P price list specifies a price amount.

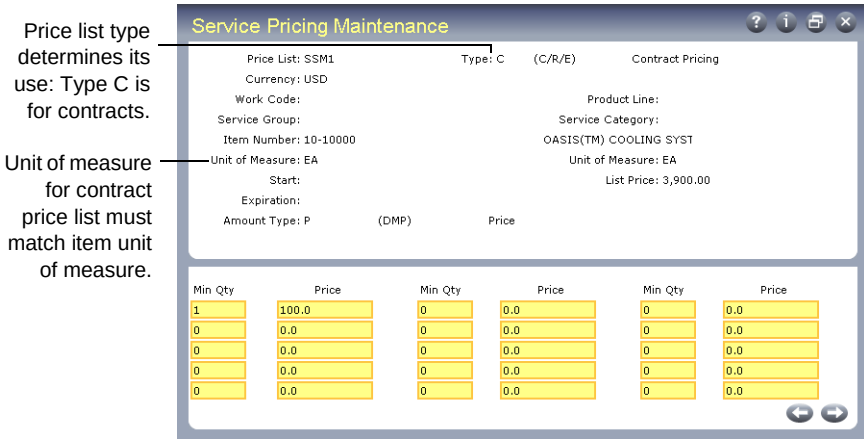
Because of the way the system uses service price lists, not all amount types are valid on each type of list—repair, contract, and expense cost. How the system uses amount types is discussed in the following sections on each kind of price list.

The amount type is not part of the unique index that defines a price list. This means that for any combination of key fields, you can define a price list with only one amount type.

Contract Price Lists

Define contract price lists with Service Pricing Maintenance (11.17.1). Specify prices for items covered on contracts and additional charge items on this type of price list.

Fig. 6.1
Contract Price Lists



Associate contract price lists with contract types in Contract Type Maintenance. The contract type establishes the default price list for individual contracts.

You can set up contract pricing by item number or by product line. Every item in the item master must belong to a product line. Pricing by product line is especially useful with contract price lists if you offer coverage at the same rate for all products in a product line.

Amount Type

You can use any amount type for contract pricing. When you create a type P list, the system reads the price for a period of coverage directly from the price list in Contract Maintenance. When you create a type D list, the system determines the price for coverage by applying the discount percent to the price of the item in the item master. When you create a type M list, the system determines the price for coverage by applying the markup percentage to the cost set for the item at the contract site.

Prices for Additional Charges

Some service organizations have other items they include with a contract that either add to the price or create a discount. Define these charges in Contract Additional Charges (11.5.7). When you define a charge, you must specify an amount type of P for percentage or F for fixed amount.

See “Contract Additional Charges” on page 255 for details.

Set up prices for additional charge items on a contract price list. Specify the additional charge item name in the Item field; leave the unit of measure blank. The additional charge amount type field determines the amount type of price list:

- If the additional charge is a fixed amount, the price list amount type must be P for price. The price is a fixed amount to be added to or subtracted from the price of the contract for each period.
- If the additional charge is a percentage, the amount type can be either D or M. M is the default. The system interprets this kind of price as a percentage to be applied to the entire contract. The percent is negative for a discount price and positive for a markup.

Example Table 6.1 illustrates four kinds of additional charges.

Table 6.1 Sample Additional Charges

Additional Charge Item	Amount Type	Price List Type	Quantity	Price
FedEx Delivery	P (percentage	M (markup)		2
Refurb Items	P (percentage)	D (discount		2
Additional Caller	F (fixed amount)	P (price)	+1	2
Only One Caller	F (fixed amount)	P (price)	–1	2

In each example, the price in Service Price List Maintenance is 2. However, the system applies 2 differently based on other factors:

- When you create a contract and specify FedEx Delivery as an additional charge, the system adds 2% to the contract total.
- When a user agrees to accept refurbished replacement items, the system takes a 2% discount from the contract total.
- When you create a contract and specify Additional Caller, the system adds $2 for each period billed on the contract.
- When a user agrees to have only one person call, the system subtracts $2 for each period billed on the contract.

Repair Price Lists

Define repair price lists with Service Pricing Maintenance. Associate them with contract and warranty types in the Call Price List field.

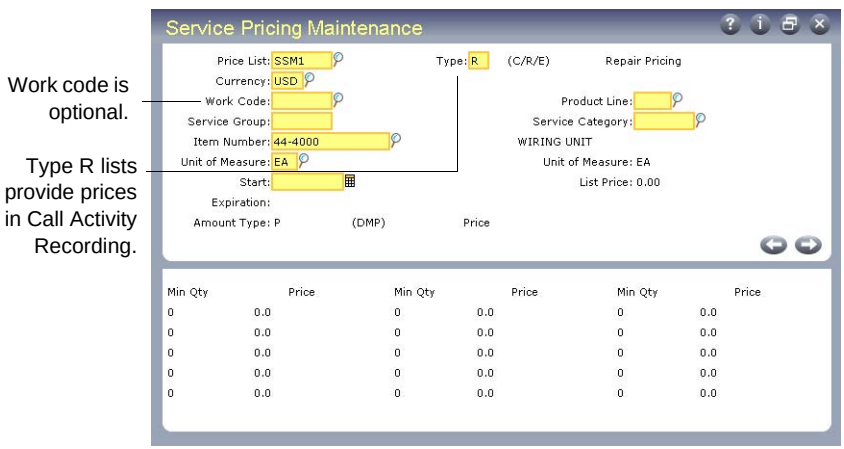
When coverage for activity recorded in Call Quote Maintenance and Call Activity Recording is found on a warranty or contract type, the price list defaults from the referenced type. When coverage is found on a contract, the call price list defaults from the contract. The contract call price list initially defaults from the type, but can be changed.

You can record three different kinds of consumption in CAR: labor, expenses, and items. You set up price lists for labor and expenses differently than for items.

Pricing for Repair Items

Figure 6.2 illustrates a repair price list for items.

Fig. 6.2
Repair Price List for Items



When items are consumed in CAR, the system searches the price list on the call header for each item's price. If a price is not found, the system looks for the item's list price in the item master. If the item is not in the item master, the price defaults to zero. The key factors in the price list search are the item or item group and the work code.

Items or Item Groups

You can set up price lists for individual item numbers or for a group of items. The product line and service group provide alternate ways of grouping items.

Product Line. Every item in the item master must belong to a product line. The system uses the product line of the item being consumed in the price list search.

Service Group. Associate items with a service group in Service Item Maintenance (11.3.7). Service groups provide a way for you to group items according to criteria you define. If you use service groups as an important item grouping category, you can base price lists on them. The system uses the service group of the item being consumed in the price list search.

Work Code

An item can have different prices, depending on the kind of work being done. For example, an item's price may vary depending on whether it is used during an installation, a repair, or a preventive maintenance visit.

The work code provides an additional layer of differentiation above the item selection. In addition to a work code, you must still specify an item number or some kind of item grouping—service group or product line.

Service Units of Measure

In service activities, two units of measure you define in the Call Recording/Invoicing frame of Call Management Control have a special significance.

- The system uses the Exchange UM in Call Activity Recording to determine the credit given for an exchanged item. When the return status you specify indicates an exchange and the item being returned has no coverage, the system searches for an exchange price with the exchange unit of measure on the repair price list associated with the call. This price displays as the default exchange price for the item.

- Fixed Price UM defines the price for a fixed price repair. You specify fixed prices for the item being repaired, not the parts used in the repair process.

Amount Type

You can use any amount type with repair price lists for items. When you create a type P list, CAR reads the item price directly from the price list. When you create a type D list, CAR determines the price for the item by applying a discount percent to the price of the item in the item master. When you create a type M list, CAR determines the price for the item by applying a markup to the cost set for the issuing site.

Search Order

During processing, the system looks for prices in the sequence listed in Table 6.2.

Table 6.2
Search Order for Repair Item Prices

Search Order	Work Code	Service Group	Product Line	Service Category	Item Number
1	✓				✓
2					✓
3	✓		✓		
4			✓		
5	✓	✓			
6		✓			

Included in the price list search are currency, unit of measure, and effective days.

Labor/Expense Pricing for CAR

Price lists for labor and expenses consumed in CAR are based on service category. You can define as many service categories as you need, each representing a particular kind of labor or expense charge.

For example, if you are tracking travel expenses in CAR you might set up three service categories for ranges of hotel room expenses: room1, room2, and room3. Then you set up prices for each service category using Service Pricing Maintenance.

Figure 6.3 illustrates a repair price list for a labor service category.

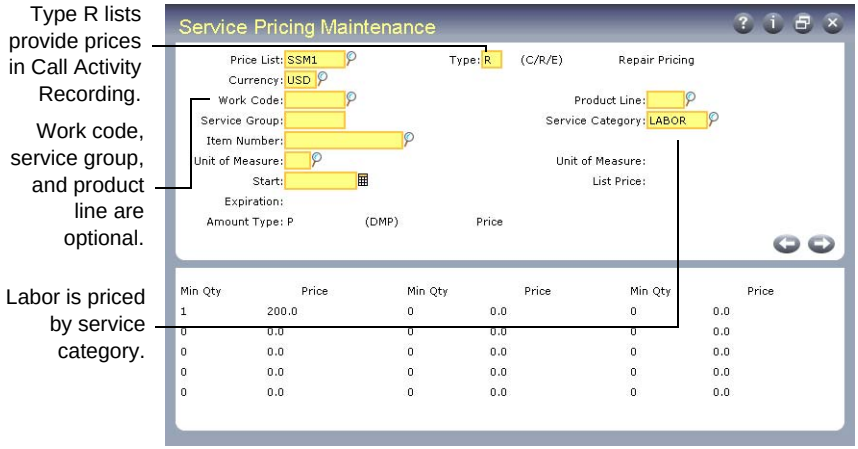


Fig. 6.3
Repair Price List for Service Category

The system can consider other factors in the search for labor and expense prices: work code, service group, and product line. For example, the price for installation labor may be different than for repair labor. If you include service group and product line when you set up prices, they refer to the service group and product line of the item being repaired. This is different than for item price lists, where service group and product line refer to the item being consumed.

If the system finds no price for the labor or expense on the list, it defaults to zero.

Unit of Measure

Set up labor and expense prices with a blank unit of measure.

Price Lists for Less than One Unit

For the system to calculate prices for partial units, set up a price for a minimum quantity of 0. The system uses this price if, for example, you record a half hour of labor. This is especially important for labor and expense price lists, since they are more likely to be used for partial units.

Amount Type

Prices for labor and expenses cannot use a discount amount type, because, unlike items, there is no list price to discount. Costs, on the other hand, are available for both labor and expenses. The system derives labor costs from the work center associated with a standard operation, a routing step, or the Service Work Center in Call Management Control. If you define expense costs on an expense cost list, you can use both amount type M and P with labor and expenses.

When you create a type P list, CAR reads the price of the labor or expense from the price list. When you create a type M list, CAR determines the price for the labor by adding a price from the price list to the standard labor cost associated with the service work center. Similarly, the system determines the price for an expense by adding the price list price to the list price defined on an expense cost list. In either case, if the system does not find a cost, the price is zero.

Search Order

During processing, the system looks for prices in the sequence listed in Table 6.3.

Table 6.3
Search Order for Labor and Expense Prices

Search Order	Work Code	Service Group	Product Line	Service Category	Item Number
1	✓	✓		✓	
2	✓		✓	✓	
3	✓			✓	

Search Order	Work Code	Service Group	Product Line	Service Category	Item Number
4		✓		✓	
5			✓	✓	
6				✓	

Included in the price list search are the call currency and effective days. Set up labor and expense prices with a blank unit of measure.

Expense Cost Lists

You also define expense cost lists with Service Pricing Maintenance.

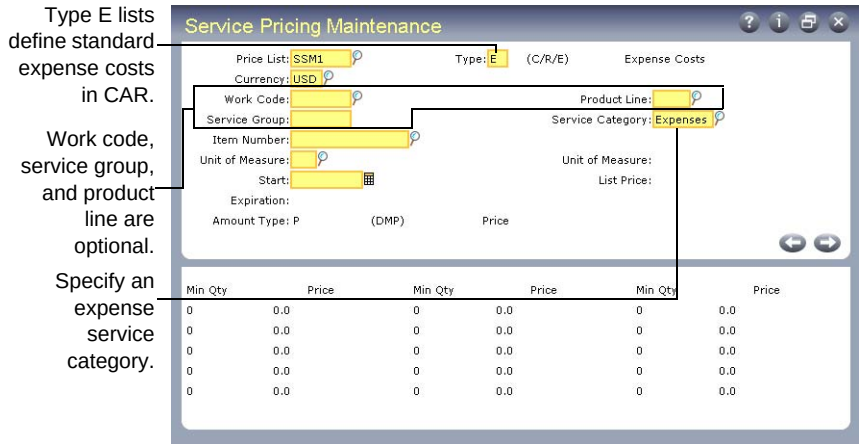


Fig. 6.4 Cost List for Expenses

The cost list determines the standard cost for expenses recorded in Call Quote Maintenance and Call Activity Recording. The cost list must have the same price list code as the corresponding repair price list specified on the service type. If the system finds no cost, the standard cost for the expense defaults to zero.

Note Cost lists apply only to expenses. The system derives the cost of labor from the work center specified for standard operations and routing steps or the default service work center in Call Management Control. It determines the cost of items from costs you specify in the item master or costs per site.

Set up cost lists just like expense price lists, using the service category as a base and optionally including work code, service group, and product line. The system uses the same search algorithm, with the call currency and a blank unit of measure. The only amount type you can use with expense cost lists is P for price.

Field Validations

See Table 6.1 and Table 6.2 for valid field combinations.

Because you can create three different types of price lists with Service Pricing Maintenance, the field validations can be complex. The system displays a message if you do not follow these guidelines:

- Set up a price list of any type by entering at least one of the following: work code, service group, product line, service category, item.
- Use a work code in combination with other codes. For labor and expenses, the work code qualifies the service category. For items, the work code qualifies service group, product line, or item.
- Use service category or item number, but not both. For labor and expenses, the service category is the equivalent of an item number.
- Use service group, product line, or item number alone, not in combination. Base repair price lists for parts on service group with or without work code, on product line with or without work code, or on item with or without work code.
- Leave the unit of measure blank when you specify an additional charge item on a contract price list. This is also true for repair price lists for labor and expenses and expense cost lists. If you enter a unit of measure, the system clears it and displays a message.

  Match the unit of measure to the unit of measure of the item in the item master when you specify an item on a contract price list. The system adjusts it if you enter any other unit of measure.
- For repair price lists for items, match the UM to the item's UM in the item master, or the fixed or exchange unit of measure in Call Management Control. If you specify any other unit of measure or leave the field blank, a message displays.
- Base contract price lists on product line or item number; the work code, service group, and service category fields do not apply and must be blank.

- Base type R labor and expense price lists on a service category. The system checks that the service category specified has one of the labor or expense fields set to Yes; otherwise, a message displays.
- Specify Amount Type P or M for labor and expense repair price lists. You cannot use discount prices.
- Base type E expense cost lists on a service category. You cannot leave this field blank and you must specify a service category with one of the expense fields set to Yes; otherwise, a message displays.
- Specify additional charge items only on a contract price list.
- Specify Amount Type P for expense costs, since there is no base for a discount or markup.
- Specify Amount Type P for a fixed amount additional charge.
- Specify Amount Type M or D for percentage additional charge.
- Specify a minimum quantity of one or less for a percentage additional charge. A percentage additional charge applies to an entire service contract. Therefore, you cannot set up multiple prices for it.

Service Pricing Maintenance

Figure 6.5 illustrates Service Pricing Maintenance (11.17.1). Remember when setting up price lists that you cannot use all fields for each type of price list, and not all combinations of fields are valid. Table 6.1 and Table 6.2 summarize valid combinations.

Fig. 6.5
Service Pricing Maintenance (11.17.1)

Price List. Price list codes identify a pricing structure that defines specific prices at different quantity levels. State prices in terms of the company base currency or any other valid currency defined in Currency Maintenance (26.1). These tables determine the prices the system suggests for items and additional items on contracts; for items, labor, and expenses consumed in Call Activity Recording; and for expense costs in CAR, depending on the price list type.

Type. Select a price list type. Choices are:

- C for contracts
- R for repairs
- E for expense costs

Currency. Enter the currency of the prices on this price list. The system uses this price list only if the currency of the service transaction is the same as the price list currency. If you do not set up a price list in the currency of the service transaction, item prices defaults from the Item Master list price or are blank and you must specify them.

Work Code. Work codes designate what type of work is performed during service activity. Set up prices based on the kind of work being done. For example, preventive maintenance labor may cost less than repair labor or installation labor. Work Code does not apply to type C lists.

Service Group. If you assign each item you set up with Service Item Maintenance to a service group that represents your grouping scheme, you can base repair and cost prices on the group. For items consumed in CAR, this is the service group of the item consumed. For labor and expenses, this is the service group of the item being repaired.

Product Line. Each item in the item master must belong to a product line. Base contract, repair, and cost prices on product line. For contracts, this is the product line of the item being supported. For items consumed in CAR, this is the product line of the item consumed. For labor and expenses, this is the product line of the item being repaired.

Service Category. Set up repair price lists for labor and expenses and expense cost lists by service category. If you specify a service category, you can also specify a product line, service group, or work code; item number must be blank. Service category must by for expenses or labor.

Item Number. A warning displays if the item is not a valid item number in the item master or an additional charge item defined with Additional Charge Maintenance. However, you can define prices for items you do not manufacture. You can specify item numbers only on a contract or repair price list, and then only if service group, product line, and service category are blank. Specify additional charges only on a contract price list.

Unit of Measure. Indicates the unit of measure associated with this price list structure. For service price lists, this is normally blank. For an inventory item, unit of measure can be blank; If you specify a value here, it must be the item's unit of measure as defined in the item master or one of the special service units of measure. Leave UM blank for the other price list structures and for contract additional charge items.

- If the price list is for items consumed in CAR, you can specify the exchange unit of measure, defined in Call Management Control, for credit amounts for items returned.
- You can use the fixed price unit of measure defined in Call Management Control to specify an amount for a fixed price repair. In this case, the item number refers to the item being repaired, not an item being consumed.

Unit of Measure and List Price. If you specify an item defined in the item master, the primary description, unit of measure, and list price in Item Master Maintenance display for reference.

Start and Expiration. Enter values to determine the effective dates for this price list. If blank, the price list is always effective. When determining which price list to use, the system compares the transaction date with the price list start and expiration dates. If the transaction date falls on or between these dates, the system selects the price list with the latest start date that has not expired.

Important The system finds a price list with a blank effective date first, so make sure you use effective dates consistently.

Amount Type. The default is P unless this is a percentage additional charge item, in which case it defaults to M. Possible values are:

- *D (Discount %).* Discounts are percentages the system takes from the item list price defined in the item master. Use the type D amount type for contract prices and percentage additional charges, and for repair prices for items.
- *M (Markup %).* Markups are percentages the system adds to the item GL cost at the relevant site. Use the type M amount type for contract prices and percentage additional charges; for repair prices for items, labor, and expenses.
- *P (Price).* A type P price list specifies a price amount. Use the type P amount type for contract prices and fixed additional charges; for repair prices for items, labor, and expenses; and for expense cost lists.

Min Qty. The minimum order quantity required for this price structure to apply. Quantity sets different prices at different order quantities. For example, you may offer a lower price when more than 5 items are consumed in CAR or more than 10 hours of labor are used. The system allows up to 15 different quantity levels. Enter quantity levels in ascending sequence.

If you want the system to calculate prices for partial units, set up a price for a minimum quantity of 0. The system uses this price if, for example, it records a half hour of labor.

For an additional charge item of type P for percentage, Min Qty must be 0 or 1 and you can specify only one quantity and price combination.

Price, Discount %, Markup %. The price the system uses when calculating prices for this quantity level. The label of this field changes depending on Amount Type. Price represents an amount if the amount type is P; it represents a discount percent if Amount Type is D, and a markup percent if Amount Type is M.

Service Price List Copy

Service Price List Copy (11.17.4), illustrated in Figure 6.6, is similar to Price List Copy (1.10.2.5), with additional selection criteria for service attributes. Use it to quickly create alternate price lists from one base price list, automatically recalculating prices based on currency exchange rates. You can also adjust existing price lists by increasing or decreasing prices with an adjustment percent.

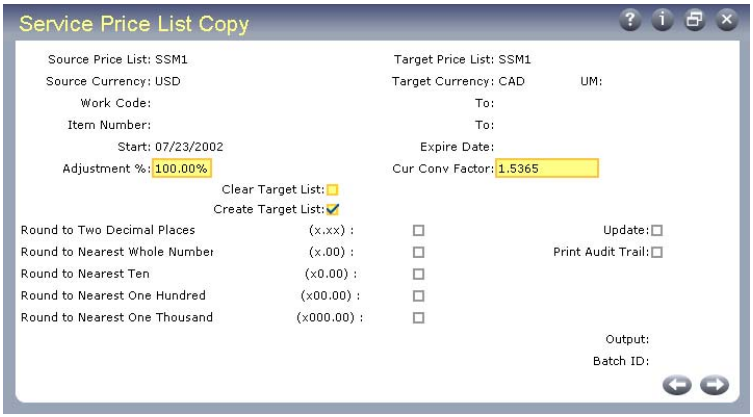


Fig. 6.6
Service Price List Copy (11.17.4)

Source Price List. Enter a service price list code for the system to use as the source of the data it copies to the target price list.

Source Currency. Enter the currency of the prices being copied. The system copies pricing information and currency rate from the source price list to the target price list for the range of work codes and item numbers you specify.

Target Price List. Enter the code for the system to use as the destination of the information being copied. The target and source price list can be the same. In this case, the system adds an ending effective date to the source list and a starting effective date to the target list. If the target list is not the same as the source and does not exist, you can create it. If it does exist, you can clear it or add to it.

Target Currency. Enter the currency for the system to use on the target prices. The source and target currency can be the same—leave blank for the system to default the source currency. If you are copying from one currency to another, the system calculates and displays a default

Currency Conv Factor using the exchange rate effective on the price list start date. The system adjusts prices on the target list using the conversion factor you specify.

UM. Unit of measure for the target prices. The system copies only prices in this unit of measure from the source price list. Leave blank to copy prices regardless of the unit of measure.

Work Code and To. Enter a range of work codes for the system to use as selection criteria in choosing prices to copy.

Item Number and To. Enter a range of item numbers for the system to use as selection criteria in choosing prices to copy.

Start. Start date defaults to today's date and defines the start date for the new pricing structure created by the copy. The system applies this field differently in different situations:

- If the source and target codes and currency are the same and the date you enter matches the start date currently on the source price list, the system does not create a new price list. Instead, it modifies the existing price list according to any adjustment percentage you enter.
- In other cases when the source and target codes and currency are the same, the system uses the Start Date value as the start effective date on the target list and adds an ending effective date on the source list—the day before the target's start date.
- If the source and target codes are different, the system uses the start date on the target and the source list is not affected.

Expire Date. If you specify a value here, the system uses the expiration date as the end effective date for the target price list.

Adjustment %. Defaults to 100.00%. The system multiplies specific prices (amount type P) by the adjustment percent, then rounds to the specified number of decimal places. It also multiplies discount and markup percentages (amount types D and M) by the adjustment percent. If the percentage is greater than 100%, amounts are increased. If the percentage is less than 100%, amounts are decreased.

Cur Conv Factor. Enter a conversion factor to use when the source and target price list currencies are not the same. The system calculates and displays a default Currency Conv Factor using the exchange rate

in effect on the price list start date. If effective exchange rates are not found, Cur Conv Factor defaults to 1. You can modify the conversion factor, if needed. However, the value cannot be 0.

Clear Target List. Defaults to No. Determines if the system clears the target price list before copying in the new prices. If No, the system adds the prices to the existing target price list. If Yes, it clears the target price list first and then copies the new prices.

Create Target List. Defaults to Yes and indicates that the target price list should be created if it does not exist. If Yes, the system creates a list if one does not exist; if No, it does not. If Create Target List is Yes and the list exists, Clear Target List determines if the system clears the list before the copy, or if it adds an end effective date to the old prices.

Round to Two Decimal Places, Round to Nearest Whole Number, Round to Nearest Ten, Round to Nearest One Hundred, Round to Nearest One Thousand. Set only one of these to Yes, indicating the rounding method for the system to use when creating the new price list structure.

Update. Defaults to No. Determines if the system updates the target price list based on the values specified. No is usually specified to create a report of potential changes before they are made. Run Service Price List Copy first using the report-only option by setting Update to No and Print Audit Trail to Yes. This lets you review changes before actually creating or updating the target price.

Print Audit Trail. The default is Yes. Indicates if the system should print an audit report. If Yes, the system prints a report showing the effect of applying the updates to the target price list. If No, the system does not print a report.

Chapter 7

Taxes in SSM

After you set up tax structures for a database, the system applies them to all taxable transactions. However, the service functions have some unique tax features, especially Call Activity Recording (CAR) and Call Invoice Recording (CIR). This chapter provides an overview of how taxes are applied to service functions, then highlights special service features.

Important This chapter does not detail tax setup. Review *User Guide Volume 6: Master Data* for details on how to set up Global Tax Management (GTM).

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Introduction

Use the functions on the Global Tax Management (GTM) Menu (2.13) in the Addresses/Taxes module to set up tax rates and other necessary tax controls. Once defined, the system applies the various tax parameters to all taxable transactions in the database.

Each customer, supplier, product line, and item record has a field that determine whether it is normally taxable. In SSM, you set up GTM tax defaults for end users and for service categories. Service categories play the same role for expenses and labor that item master records do for items.

SSM uses the taxable status and tax codes to determine defaults for the following service documents:

- Return Material Authorizations (RMA)
- Returns to Supplier (RTS)
- Service Contracts
- Call Invoices

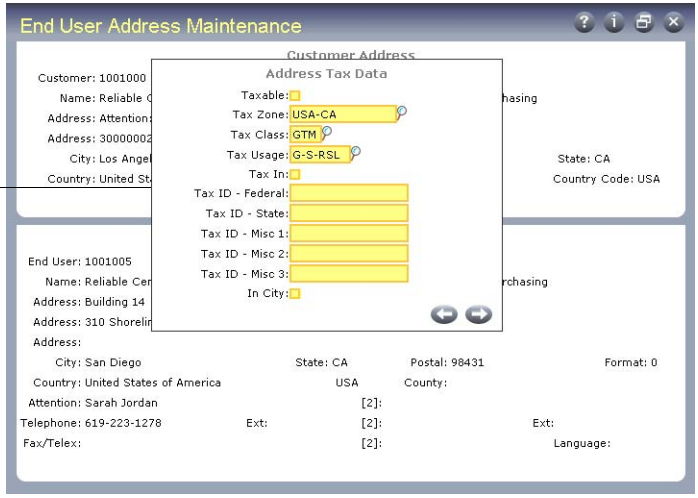
The system calculates taxes for RMAs and service contracts like it does for sales orders. It calculates taxes for RTSs like purchase orders. This chapter concentrates on taxes in Call Activity Recording (CAR) and Call Invoice Recording (CIR), which are unlike other orders in the system.

End-User Tax Detail

Tip
Tax is derived from ship-to addresses only if they are defined in Customer Maintenance.

Most transactions outside of SSM derive tax-related data from the customer address. In SSM, you can define GTM tax defaults for an end user in End User Address Maintenance. The system uses this data to determine the taxable status of the end user for service activities.

Figure 7.1 illustrates the pop-up in End User Address Maintenance that displays for GTM tax data. A similar pop-up displays when you define customers and suppliers.



Pop-up for GTM tax data in End User Address Maintenance

Fig. 7.1 End-User Tax Detail

Taxes for Call Activity

You can generate and review invoices for activity related to a call in Call Invoice Recording (CIR). You use standard sales order functions to print and post call invoices. In many ways they resemble standard sales order invoices.

However, call billing introduces another level of detail into the tax scenario. The call line item is the equivalent of a sales order line item. The call line can have beneath it any number of other records related to labor, expense, and item usage. On a taxable call, the tax status of each of these detail records can vary, adding a layer of complexity to the recording process.

Note If a call line is not taxable, the system ignores the tax setting for items, expenses, and labor and does not calculate tax. It considers lower-level settings only if a call line is taxable.

Where Are Taxes Edited?

Usually the individual who takes a call has more interest in recording the call problem and initiating an appropriate response than in tax details for the eventual billing. For this reason, tax data is not recorded in Call Maintenance.

Typically, tax detail is only minimally important during the recording of service activity. In Call Activity Recording, you can specify tax information at the call header and call line level. You can access tax data for detailed activity records only in Call Invoice Recording. When you create the call invoice, the system applies the information for the call line to the detail records in conjunction with defaults you set up for items and service categories. You modify tax defaults in Call Invoice Recording.

In summary, the three programs that manage calls enable you to progressively edit and review tax data:

- In Call Maintenance, you gather information the system uses later to determine the taxable status of the call.
- In Call Activity Recording, you review and modify tax data related to the call and call line.
- In Call Invoice Recording, you review and modify the tax data related to the call, call line, and call line usage records. You can also review and modify tax amounts in the trailer.

Tax Defaults for Labor and Expenses

You can set up defaults to streamline the calculation of taxes in various service activities. If you carefully plan the defaults for consistency, users should not need to do much editing. The system simply calculates taxes as part of the billing process.

Tip
Tax data initially defaults from the item's product line.

Only items defined with Item Master Maintenance (1.4.1) can be consumed in the service of a call. Assign a taxable status and tax code to these items.

See "Service Categories" on page 91.

Use Service Category Maintenance (11.21.9) to associate tax status and tax codes with labor and expense service categories. Since the labor and expense service category is the equivalent of an item, this provides functionality similar to the tax defaults in Item Master Maintenance. The system uses the taxable status and tax class associated with the service category as the default for labor and expense usage records for taxable call lines in Call Invoice Recording.

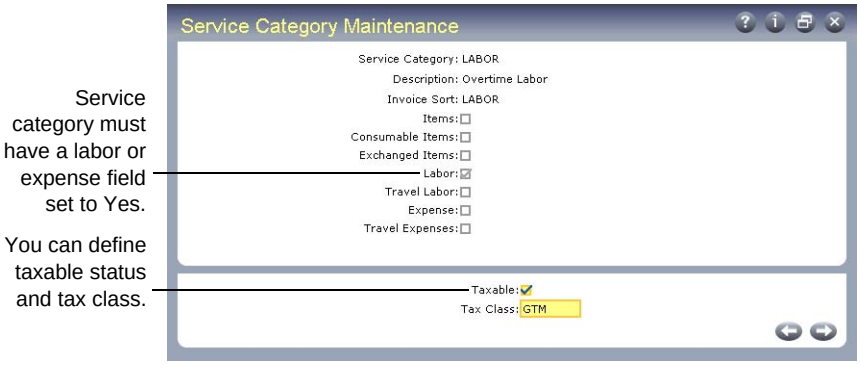


Fig. 7.2
Service Category Maintenance (11.21.9)

Taxes for Fixed Price Services

The system handles taxes for service activity provided at a fixed price differently than taxes for other kinds of calls. Normally, the system calculates taxes for each detailed labor, expense, and item usage record.

For fixed price service, it calculates tax amounts by applying the tax rate to the single fixed price. For this kind of service activity, the system does not consider tax data elements associated with detailed usage records. Taxes are calculated on the tax attributes of the call line.

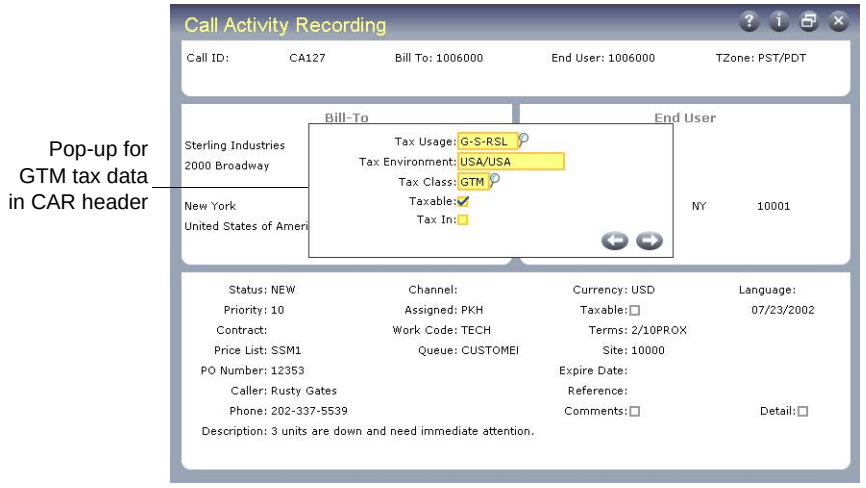
Determining GTM Tax Defaults

Global Tax Management (GTM) uses five data elements in determining taxes: tax status, tax class, tax environment, tax included, and tax usage.

Call Header Defaults

When a call is taxable, you can review and modify the five GTM data elements in a pop-up that displays in the Call Activity Recording header. These elements default from the end user on the call.

Fig. 7.3
GTM Tax Data in CAR Header



Pop-up for GTM tax data in CAR header

The From and To zone values associated with a call and the tax class of the To address determine the tax environment for the call header.

- For all call activity, the geographical location of the end user—county, city, and country—determine the To zone value.
- The tax class is the class associated with the end user in End User Address Maintenance.
- The From zone is the site associated with the call header.

Under GTM, you must define each site in Company Address Maintenance to make the required geographic values available. If you do not define the site on the call header as an address, the system uses the information for the *~taxes* record in Company Address Maintenance to determine the From zone. The same logic is used in other order functions like sales orders and purchase orders.

See *External Interface Guide: Sales and Use Tax.*

Note If you are using the interface to Vertex's Quantum™ for Sales and Use Tax to calculate taxes, the system also checks the work code when determining tax zones.

Call Line Defaults

Most of the information at the call header defaults to the call line. Another GTM pop-up displays in Call Activity Recording at the call line level, enabling you to review and modify call line item tax elements.

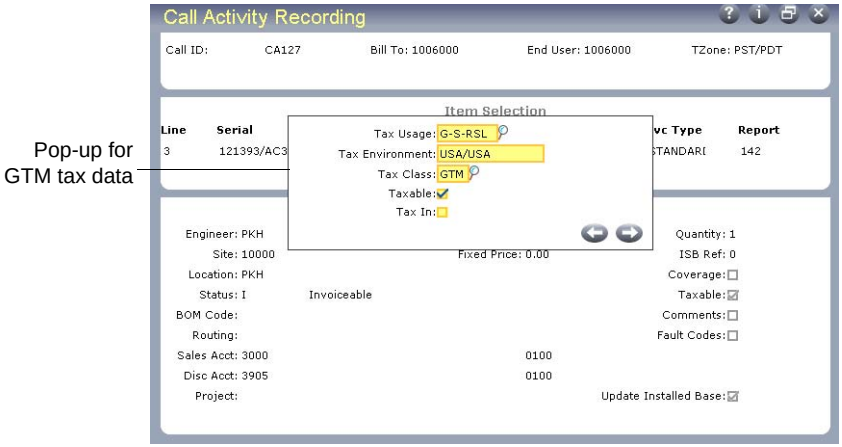


Fig. 7.4
GTM Tax Data for CAR Line Item

If you change the site associated with the call line from the call header site, the system recalculates the default tax environment.

Note You cannot modify the information in this pop-up if an invoice for the call exists. Once a pending invoice exists for the line, you can edit tax details only in CIR.

If this is a fixed price service activity, the call line elements determine the final tax calculation. No usage details are considered.

Call Usage Detail Defaults

The user does not enter any tax information for call usage records in CAR. However, the system sets up default values you can edit in CIR. When you are using GTM, the system applies the tax usage and tax included attributes of the call line by default to the usage detail records for that line.

Here again the system bases the tax environment on the To zone value—always the end user's zone—and the From zone value. The site associated with the detail usage record determines the From zone. This is the site

where items are located or the site associated with labor and expense consumption. This site defaults from the call line, but can be changed in CAR for individual usage records.

The taxable status and tax class for the usage records default for items from the values in Item Master Maintenance or from Service Category Maintenance for labor and expense service categories.

Important If the call line is not taxable, the system ignores these lower-level details.

Generating and Reviewing Call Invoices

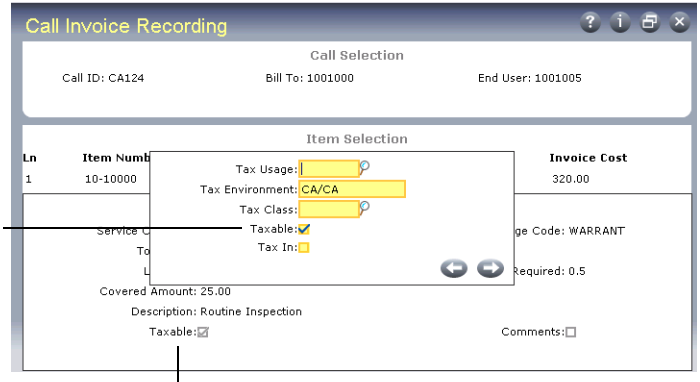
Create call invoices directly from Call Activity Recording if Invoice from Recording is Yes in Call Management Control, or generate them from Call Invoice Recording.

When you create a call invoice, the system creates billing detail records for each labor, expense, and item usage record associated with the call. It creates distinct billing records for items issued, items returned, and items exchanged, since each may be taxed differently.

Note The system also creates billing details for fixed price service; however, they do not include any price information.

In CIR, you can review and change GTM tax details at the header, line, and usage detail levels as long as the call line is taxable. If the call line is not taxable, you cannot modify tax data elements at the detail level.

Fig. 7.5
GTM Tax Data for Billing Details in CIR

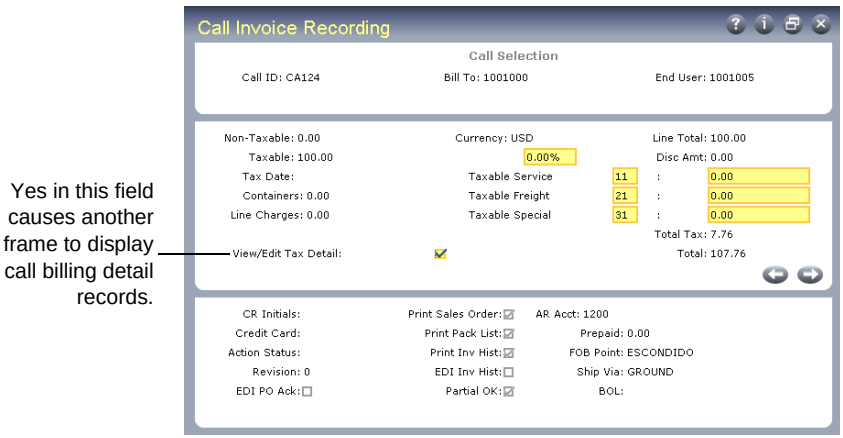


If the call line is taxable, the tax status and class on the detail records default either from Service Category Maintenance or from Item Master Maintenance. You can modify this.

Important If you make additional changes in CAR for a call line, the system deletes and regenerates the billing records associated with the line. This means that if you have overridden the default tax status or class of a detail record, you must make the change again in CIR.

Reviewing and Editing Taxes

Review and edit tax records in the Call Invoice Recording trailer, just like in a sales order trailer. If Update Tax Allowed is No for the tax rate in effect, you cannot edit tax amounts.

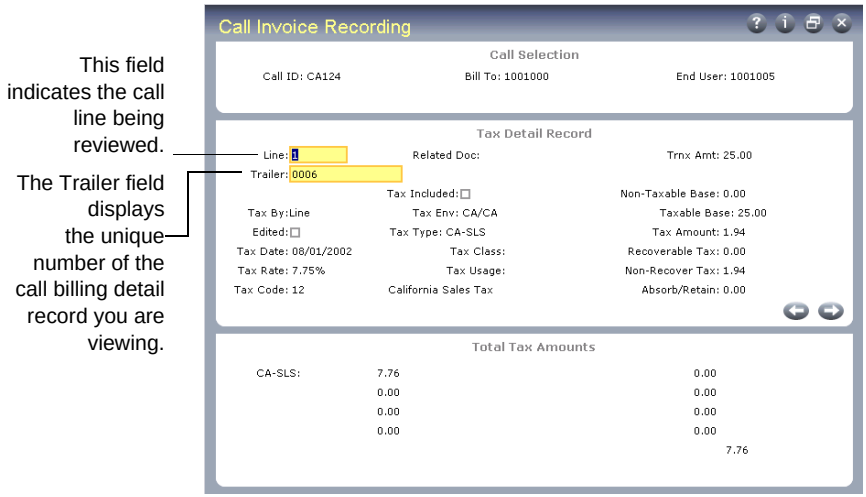


Yes in this field causes another frame to display call billing detail records.

Fig. 7.6 Trailer Frame in CIR

If View/Edit Tax Details is Yes, another frame displays call billing details.

Fig. 7.7
Trailer Frame in CIR



In a standard sales order, the Trailer field has a value only when you are viewing or editing trailer codes. Trailer codes are associated with line 99999. In Call Invoice Recording, the Trailer field also displays the index number of the billing detail record associated with the call line being reviewed.

Example You record three lines of labor and four items used for a call line. The system creates seven billing detail records numbered 01 through 07. You can review the tax amount for each separately.

The system creates tax detail records for items first, then details for labor and expenses sorted by invoice sort.

If you modify taxes, the system prompts you to recalculate taxes whenever the invoice is regenerated or whenever you access the trailer frame in CIR. If you have changed the call line in CAR, you normally respond Yes to this prompt so the system taxes any new transactions correctly. Recalculating the taxes, however, eliminates any modifications you have made.

Printing Call Invoices

If Print Tax Detail on Reports is Yes in GTM Control (2.13.24), tax detail is included by the invoice print function. This setting affects call invoices in the same way it affects sales order invoices.

Chapter 8

Service Contracts

This chapter covers creating and managing service contracts and quotes. Contract billing is discussed in Chapter 9 and preventive maintenance scheduling is discussed in Chapter 10.

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Introduction to Contracts

Service contracts, like warranties, define the rules governing agreements for service with customers. The contract specifies:

- The customer and end users receiving coverage
- Items covered
- Levels and limits of coverage
- Total coverage
- Pricing of service
- Duration of contract in months

See “Overview of Service Types” on page 164 for details.

Chapter 5 discussed service contract types and how to use them as templates for actual service contracts. The contract type associated with a contract determines many of its service attributes, including price lists, coverage hours, and response time.

Some attributes of the contract type provide default values when you define a specific contract; they can be modified. The system uses others directly to determine coverage in Call Maintenance (11.1.1.1) and RMA Maintenance (11.7.1.1).

From this viewpoint, a service contract is a unique document that ties together:

- Coverage information from the contract type
- Customer and end-user records
- Items to be supported

Contract Design

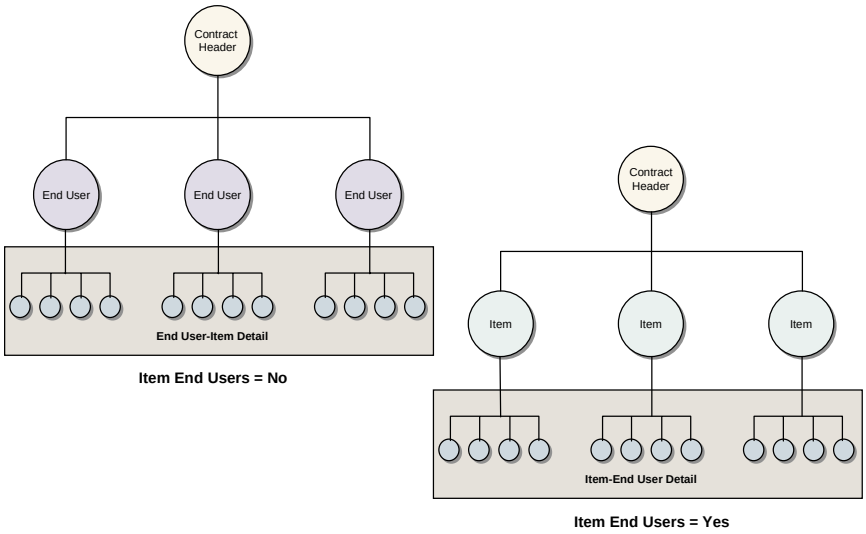
Of the three common features of contracts—contract types, customers and end users, and items—contract types are applied in the same way to all contracts. Similarly, a contract can be associated with only one customer.

However, the way you view items and end users can vary. As you design a contract, you must make a fundamental choice regarding the relationship between items and end users. Contracts can be viewed in two ways:

- A collection of end users with items requiring coverage
- A collection of items, each with one or more associated end users

Figure 8.1 illustrates the relationships between components using these two different designs.

Fig. 8.1
Contract Designs



You determine contract design by your choice of Yes or No for the Item End Users field in the contract header.

- Contracts created with Item End Users set to No are referred to as contracts in end-user/item sequence, since you enter end users before you enter items owned by the end users.
- Contracts created with Item End Users set to Yes are referred to as contracts in item/end user sequence, since you enter a default item before you specify end users who own specific instances of the item.

The distinction between these two contract designs affects every aspect of creating and maintaining a contract. This is reflected in the sequence of frames in Contract Maintenance and how data defaults from one contract level to the next. Your choice of items with end users or end users with items also affects:

- Contract billing and how billing information displays on invoices
- How tax defaults for detail lines are found
- How blanket coverage is set up and applied
- How preventive maintenance (PM) schedules are created

To ensure that the distinctions between these two types of contracts are clear, two separate screen flows are provided in this chapter:

- See “Contracts for End Users with Items” on page 264 for a discussion of contracts in end-user/item sequence.
- See “Contracts for Items with End Users” on page 289 for a discussion of contracts in item/end-user sequence.

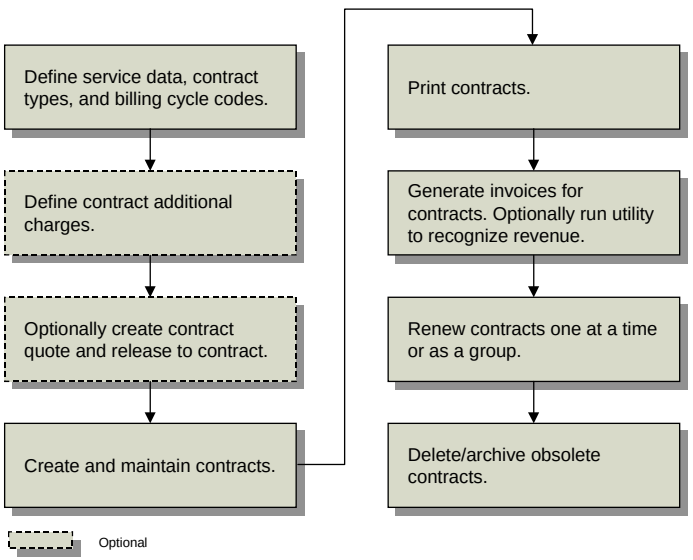
Contract Work Flow

The service contract manages billing issues regarding the repair, replacement, and support of an item. These issues arise in:

- Call and Call Quote Maintenance, where problems are registered with the support department
- Call Activity Recording, where service activity in response to a call is recorded, including labor, expenses, and items consumed
- Preventive Maintenance (PM), an optional feature of Contract Maintenance that schedules service calls in advance for items under contract
- Return Material Authorization (RMA) Maintenance, where you receive items from an end user and issue replacement items

Figure 8.2 outlines a typical contract work flow.

Fig. 8.2
Contract Work Flow


Define service data, contract types, and billing cycle codes.
Define contract additional charges.
Optionally create contract quote and release to contract.
Create and maintain contracts.
Print contracts.
Generate invoices for contracts. Optionally run utility to recognize revenue.
Renew contracts one at a time or as a group.
Delete/archive obsolete contracts.
Optional

To use contracts, follow these steps:

1. Make sure you have set up the base service data required before you can create contracts, such as customers, end users, service item information, work codes, service categories, and invoice sorts. Define appropriate defaults and controls in Contract Control (11.5.24).

2. Use Contract Type Maintenance (11.5.10) to define contract types reflecting service values you typically incorporate in your contracts. Set up other codes such as billing cycles in Billing Cycle Code Maintenance (11.5.18.1).

3. If needed, set up additional charge items in Contract Additional Charges (11.5.7).

4. Many organizations go through a review process before a contract becomes effective. To do this, use Contract Quote Maintenance (11.5.1.1) to create contract quotes, print them using Contract Quote Print (11.5.1.3), and send them to the customer. After a quote is accepted, release it to a contract using Contract Quote Release to Contract (11.5.1.5).

   If you use quotes, you can streamline the creation of new quotes by copying existing quotes or contracts using Contract Quote Copy from Quote (11.5.1.6) or Contract Quote Copy from Contract (11.5.1.7). You can also generate them from contracts during renewal as part of running Renewal Process/Report (11.5.13.10).

5. If you do not prepare quotes, create contracts directly in Contract Maintenance (11.5.13.1), or copy them from existing contracts using Contract Copy to Contract (11.5.13.5). Print them using Contract Print (11.5.13.4).

6. Depending on your billing process, release contracts to invoicing at appropriate intervals using Billing Release to Invoice (11.5.18.13). This activity creates pending invoices that are managed in the Sales Orders/Invoices module. Depending on your accounting practices, you may also need to run Revenue Recognition (11.5.18.21).

For details, see page 309.

7 A contract remains in effect until the specified end date. Renew contracts that have been fully invoiced to extend their coverage. Do this one at a time using Renew Single Contract (11.5.13.8) or use the auto-renew feature to renew groups of expired contracts with Renewal Process/Report (11.5.13.10).

8 You can archive and delete fully billed, expired contracts from the system using Contract Delete/Archive (11.5.13.23). The system checks to make sure no active calls reference a contract before it is deleted. The delete/archive can also include quotes.

Coverage Limits and Contracts

SSM provides two basic approaches to managing coverage levels and limit amounts. In the first approach, after you set up coverage levels on contract types, you are done. Each contract derives coverage levels from its associated service type.

In the second approach, you copy limits from the service type into the contract when you create it. The limits become part of the contract, and are not found by referencing the service type. You can edit these limits or create new ones.

Important Limit consumption can be tracked only with the second approach.

Options for copying service limits are also available during contract renewal. You can use the limits directly from the contract or refer back to the contract type for current effective limits.

The system monitors contract limits as you record activity in Call Activity Recording, and CAR warns you if you exceed a limit. Only the percentage of coverage affects processing in RMA Maintenance.

The approach you take is determined by the Contract Limits field in Contract Control.

Contract Limits Field

Contract Limits in Contract Control determines whether the system uses limit amounts when you create a contract, and whether you can view and change coverage records in Contract Maintenance.

When No, you cannot define limit amounts for contract types in Contract Type Maintenance—only coverage percentages. The system applies these coverage percentages to the contract as defined. You cannot modify them in Contract Maintenance; limit prompts and frames do not display.

When Yes, you can copy limits from the contract type into a new quote or contract and modify them at all levels of a contract: header, default end users or items, and detailed lines. Copying limits is discussed in the following sections.

Copying Limits

If Contract Limits is Yes, you are prompted to copy limits when you complete the second header frame in Contract Maintenance. Depending on the value of Item End Users, you are also prompted at lower levels in the contract.

If you respond with Yes, the system copies the limits as defined for the contract type into the header. If you respond with No, limits are not copied, but you can define limits unique to this contract.

Tip
You may save time by copying and modifying limits, rather than starting over.

When Item End Users is No:

- After completing end-user default information, you are prompted to copy limits to the end user. If you respond Yes, you can copy limits from the contract header or the service type.
- After completing detailed line-item information, you are prompted to copy limits to the line. If you respond Yes, you can copy limits from the end user or the service type. If end-user limits do not exist, you can copy from the header or the service type.

When Item End Users is Yes:

- After completing item default information, you are prompted to copy limits to the default item. If you respond Yes, you can copy limits from the contract header or the service type.

- After completing detailed line-item information, you are prompted to copy limits to the line. If you respond Yes, you can copy limits from the default item or the service type. If default-item limits do not exist, you can copy from the header or the service type.

If you have modified limits at one level, you may want to use the modified version as a template for the next contract level.

The copy prompt initially defaults to Yes in Contract Maintenance. If you choose not to copy limits, you are prompted each time you edit the contract, but on subsequent edit sessions, the prompt defaults to No.

Important The calculation of the amount accumulated against a limit occurs *only* when limits are copied into a contract and become part of it. It cannot take place for a contract type. If you respond with No to the copy limits prompt and do not define limits in Contract Maintenance, the system applies the level of coverage defined for the contract type without regard to limit amounts.

See “Exchange Rate” on page 252.

If you are using limit amounts or list price limits, the system converts them to the contract currency when they are copied into the contract using the effective exchange rate.

See “Automatically Generating Contract Lines” on page 262.

Note If you are generating lines automatically using the Source field in the contract header, you do not have the opportunity to copy limits. The system creates each line without its own limits.

Copying Effective Dates into Contracts

When limit records are copied into a contract, the system sets effective dates if none are defined. If the records have effective dates, the system ensures that the dates fit within the start and end of the associated contract level: header, end user or default item, or item detail.

In a simple case, you can set up limits on a contract type without any effective dates, then create a contract based on that contract type. The contract start date is 1/1/02 and end date is 12/31/02. When limits are copied into the contract, they are copied with these effective dates.

Now consider what would happen if you had two sets of limits on the contract type with the following effective dates:

```
06/30/02 - 06/30/03
07/01/03 - 06/30/04
```

When you create the same contract from 01/01/03 to 12/31/03, you still have two sets of limits, but they are copied in with these dates:

```
01/01/03 - 06/30/03
07/01/03 - 12/31/03
```

Limits at Multiple Levels

The contract type is a template for building service contracts. If Contract Limits is Yes in Contract Control, you can further refine or customize the limit template at the contract level, for end users or default items, and on individual lines within the contract.

See “Levels and Limits of Service” on page 170.

As a result, you can set limits at four levels: contract line, end user or default item, contract header, and contract type. However, while it is possible to set up limits at all levels, the system uses only one level to determine coverage for a particular item.

When the system looks for effective limits, it uses a multiple-phased approach. First it finds where limits are defined by searching in the following order:

1. The contract line item defined in Contract Maintenance
2. If Item End Users is No, the end-user level; if Item End Users is Yes, the default-item level
3. The contract header defined in Contract Maintenance
4. The original service type defined in Contract Type Maintenance

When the system finds a coverage record, it examines the terms in this order:

1. Limits for a work code and service category combination
2. Limits for an invoice sort related to the service category
3. Limits for the contract total

If none of these exist, the system considers the activity being recorded not covered. In Call Activity Recording (11.1.1.13), charge code defaults to the billable charge code, as defined in Default Charge Code Maintenance (11.21.21.13).

Important This search algorithm has important implications. If you decide to set up limits at the contract-line level, set up all necessary limits at that level. You cannot combine limits from multiple levels since the accumulation of amounts against those limits would become ambiguous.

Changing Limits

You can change limits on a contract after the contract is effective. However, if CAR has accumulated any amounts against the limits, certain restrictions apply:

- The limit record cannot be deleted, nor can the contract line and contract.
- The limit amount cannot be lowered below the accumulated amount.
- The effective dates cannot be moved inside the range defined by the call open date of the first and last call with accumulating amounts.

If you must make a change, modify the covered amounts in Call Activity Recording or Call Invoice Recording. If the invoice for the amounts has been posted, you cannot modify the records associated with it.

Adding Additional Limit Records

You might need to add limits to an open contract, for example, if some of the contract is renegotiated. The system prevents this change if any call lines reference the contract header or line for coverage. Adding limits could result in invalidating those that currently exist.

To prevent limit consumption at invoice post from not matching consumption in CAR, limit records cannot be added to a contract until you post all open call reports.

Example A limit line provides 50% coverage for the Labor invoice sort. A call references this limit and the covered amount is based on it. Now you add a limit record to the contract for work code TECH and service category LABOR1 for 25% coverage. This new record applies to the line currently open that used the Labor invoice sort coverage. When the invoice is posted, the limit that now applies—work code and service category—is not the one applied in CAR.

Changing Contract Start and End Dates

The effective dates on limits are related to the start and end dates at the associated contract level. As a result, you cannot always change the contract dates. When open calls reference limit records, you cannot move the contract start or end date within the range defined by the open dates of the first and last call with accumulated amounts.

Example A contract starts on 11/01/00 and ends on 12/30/00. You take a call on 11/15/00 for an item covered by a contract line and record activity that consumes limits in Call Activity Recording. You cannot move the contract start date after 11/15/00 or the end date before it.

The system only checks for accumulated amounts. Additional calls may have been opened based on the current contract open date and activity not yet recorded. When you access the call in CAR, the contract coverage will no longer be valid.

Changing Service Types for Contract Lines

The system uses the service type on the contract header by default for each line item added. However, you can use a different service type for a particular line item. If you change the service type when adding a new line to the contract, the system uses the price list, limits, and product line associated with the new service type for this item.

If you change the service type after adding a line to the contract, the system must make additional checks. If you are using contract limits when you change the service type, you are prompted to delete the old limits and copy in the ones from the new service type.

If you respond Yes, the system attempts to delete the old limits and apply the new. However, if any amounts have been accumulated against the current limits, they cannot be changed. Instead, a warning message displays.

You are also prompted to see if you really want to change the price of coverage for the item. If you respond Yes, the system changes the price; otherwise, it does not.

Changing the service type after a contract is in effect is not recommended and could have unpredictable results.

Renewal and Contract Limits

When Contract Limits is Yes in Contract Control, the system provides two options for managing limits during contract renewal. The Renew Limits From field in Contract Control has two values.

- C indicates that limits should be copied from the old contract. The system changes the effective dates on the limits to reflect the start and end dates of the renewed contract. This is the correct choice if you have created limits that are unique to a particular contract or modified limits copied from the service type.
- S indicates that limits should be copied from the contract type, just as when a contract is created. This is useful for organizations that want to phase in changes by setting them up in the contract type using effective dates. During renewal, the system applies the limits that are effective for the new contract start date.

Renew Limits From in the control program defaults to Contract Maintenance, where you can modify the setting on a contract-by-contract basis. When one contract is copied or renewed, you can modify this value. When you renew in batch, the system checks the value for each contract and processes it according to the option selected.

Note Whenever limits are copied or renewed, the system resets any amounts recorded against them to zero.

Effect of Renew Limits From Field

The Renew Limits From field affects all of the programs that copy limits.

- Contract Quote Release to Contract (11.5.1.5). Limits are copied exactly as defined in the quote, regardless of the setting of Renew Limits From. The quote is released as is, since this is the way the customer reviewed and accepted it.
- Contract Quote Copy from Quote (11.5.1.6) and Contract Quote Copy from Contract (11.5.1.7). You can modify the Renew Limits From setting before executing these functions. When quotes are being created, the start date defaults from the start date of the quote or contract being copied and the system does not verify overlapping coverage.
- Contract Copy to Contract (11.5.13.6) and Renew Single Contract (11.5.13.8). You can modify Renew Limits From before executing this function. The default start date of the new contract is after the end date of the original contract, and the system verifies that overlapping coverage is not created.
- Renewal Process/Report (11.5.13.10). You cannot modify Renew Limits From. The system reads it from each contract as defined in Contract Maintenance.

Determining New Effective Dates

If you are using option C (contract) when copying limits, the system adjusts the effective dates of the source contract or quote to fit the date range of the new contract or quote. If you renew a contract for a 12-month duration for another 12 months, copying and adjusting the limits is very straightforward.

Example Consider a 12-month contract effective from January 1, 1999 to December 31, 1999 with two limits:

```
The first limit is effective from 1/1/99 to 6/30/99
The second is effective from 7/1/99 to 12/31/00
```

When you renew this contract for the same date range in 2000, the system copies the limits and adjusts the year from 1999 to 2000.

Now renew the contract from 5/1/00 to 4/30/01. The system adjusts the year and calculates the monthly offset from the old contract start date (1/1/99), which is 4. The system adds the offset to the limits:

```
1/1/99 to 6/30/99 becomes 5/1/00 to 10/31/00
7/1/99 to 12/31/00 becomes 11/1/00 to 4/31/01
```

However, contracts do not have to start on the first of the month. What happens if the original contract is renewed from 5/15/00 to 5/15/01? The system calculates a month offset (4) and a day offset (14) and adds them to the original limit dates:

```
1/1/99 to 6/30/99 becomes 5/15/00 to 11/14/00
7/1/99 to 12/31/00 becomes 11/15/00 to 5/14/01
```

Consumption of Limits

When you record activity in Call Activity Recording, the system accumulates amounts against limits found at the lowest level of the contract. If you have set up limit amounts using effective dates, the amount applies from the start to the stop date of the effective range.

Example You might have limits with effective dates like those in Table 8.1.

Table 8.1
Effective Dates

Invoice Sort	Amount	Effective Dates
Labor	$500	1/1/99 - 6/30/99
Labor	$250	7/1/99 - 12/31/99

If $500 of service has not been recorded by 6/30/99, the unused amount does not carry over. On 7/1/99, the system resets the accumulated amount to zero and allows only $250.

Items returned for credit in Call Activity Recording do not affect limit consumption. The system does not reverse consumption based on a credit.

Viewing Contract Consumption History

Two reports give you an overview of how limit amounts have been consumed.

Limits Consumption Inquiry

The Limits Consumption Inquiry (11.5.13.21.4) displays consumption for limits selected by contract number, customer, order date, and end user.

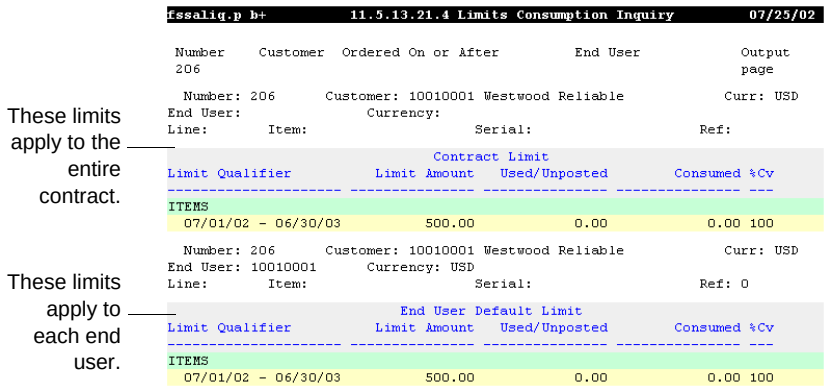

These limits apply to the entire contract.
These limits apply to each end user.
fssaliq.p b+ 11.5.13.21.4 Limits Consumption Inquiry 07/25/02
Number Customer Ordered On or After End User Output
206 page
Number: 206 Customer: 10010001 Westwood Reliable Curr: USD
End User: Currency:
Line: Item: Serial: Ref:
Contract Limit
Limit Qualifier Limit Amount Used/Unposted Consumed %Cv
ITEMS
07/01/02 - 06/30/03 500.00 0.00 0.00 100
Number: 206 Customer: 10010001 Westwood Reliable Curr: USD
End User: 10010001 Currency: USD
Line: Item: Serial: Ref: 0
End User Default Limit
Limit Qualifier Limit Amount Used/Unposted Consumed %Cv
ITEMS
07/01/02 - 06/30/03 500.00 0.00 0.00 100

Fig. 8.3 Limits Consumption Inquiry (11.5.13.21.4)

When an end user is specified, limit consumption for that end user only is listed in the output. In this case, no consumption for contract-wide limits displays, since these limits are not associated with an end user.

When an end user is specified, limit amounts are expressed in the end user's currency.

For details, see "Multicurrency and Limit Amounts" on page 252.

This inquiry shows limits at all levels of a contract. The limit frame title identifies the kind of limit: contract, end-user default, item default, and detail.

- The kind of limit displays under the Limit Qualifier heading. This can be an invoice sort, a work code and service category combination, or a limit set for the total (Total Limits).
- The limit amount displays in the Amount column. Contract and default item limits are in the contract currency. End user and detail item limits are in the end-user currency.

- The Used column displays amounts recorded in Call Activity Recording but not yet consumed through invoice post. These amounts are subject to change. For example, modifying the covered amount or the charge code in CAR may change the amount the system uses against this limit.
- The Consumed column displays amounts posted against this limit by call invoices.
- The %Cv column displays the level of coverage for this coverage limit.

Limits Consumption Report

The Limits Consumption Report (11.5.13.21.5) provides information similar to the inquiry with additional options.

Fig. 8.4 Limits Consumption Report (11.5.13.21.5)

Selection criteria include ranges of contract numbers, end users, customers, contract (order) dates, and contract languages. If Print Call History Detail is Yes, information about each call that affected the limits is included in the report.

Note Call detail is available to the system only when Record Limits History is Yes in Contract Control.

The limits consumption report is more detailed than the inquiry. The following sample shows only the first seven columns of information reported.

Fig. 8.5
Limits Consumption Report Output

```
Number: 292       Customer: 100-h     Lake Refrigerator Co.   Currency: USD

   Invoice Sort  Wk Code   Svc Cat   Start     End Date    Amount  Used/Unposte
   ------------- --------  --------  --------  --------  --------  ------------
   Total Limits                      03/01/02  03/31/02  3,000.00         100.0

       Call    Line  Item Serviced  Report Oper  Usage   Consumed  Act  Date
       ------- ----  -------------  ------ ----  ------  --------  -------- 
       CA818      7  21-1000        403456   10  21-20     100.00  3/14/02


Line: 1    Item: 116                electric generator        Serial: 9  Ref:
End User: 1001000  Currency: USD

   Invoice Sort  Wk Code   Svc Cat   Start     End Date    Amount  Used/Unposte
   ------------- --------  --------  --------  --------  --------  ------------
   Total Limits                      03/01/02  03/31/02  3,000.00          0.00
```

The report uses separate columns to display the invoice sort or work code and service category used to define the limits. The other columns display similar amounts as the inquiry.

Tip
The system uses the call open date to search for effective limits.

Call detail includes the call number, line affecting the limit, item for which service was provided, operation, component part or service category used on that call line, the amount consumed (posted), and the activity date. The date in the call history detail is the date the system used to search for effective limits, which is the call open date.

Contract Pricing

This section covers issues related to the application of price lists in Contract Maintenance, the influence of contract currency, and the handling of credit issues in contracts.

Contract Line Pricing

This section discusses how the system applies price lists in Contract Maintenance.

Contract pricing differs from pricing for sales orders in one important way. In the case of a sales order, the item being sold normally has a price in Item Master Maintenance. If the system does not find a price on a price list, it uses the item master price and calculates discounts relative to item master prices.

In the case of contract line items, the equivalent of an item master price does not exist. The system handles this in two ways, depending on whether it finds a price on a price list for the coverage.

Price from Price List

When the system finds a price on the line-item price list, it displays it in the Net Price field and sets a value for the List Price field, displayed in the item detail. *From this point on, List Price cannot be changed.* If you modify the net price, the modification displays in the Discount field as either a positive or negative discount, relative to the fixed list price. If you manually enter a discount percent, the system recalculates the net price based on this percentage and the fixed list price.

No List Price Found

When the system cannot find a price for contract coverage, net price defaults to zero. In this case, what you enter in Net Price also becomes the List Price value. If you then specify a discount in the item detail, the system recalculates the net price based on this discount. The list price remains as specified.

So far, this seems to be the same as what happens when the system finds a price on a price list. However, when you change the Net Price value in this second scenario, the system resets List Price to the Net Price value and Discount % to zero. Reenter a discount if one is required. To alert you to the consequences of changing the price, the following message displays when the edit focus is in the Net Price field:

```
If updated, net price will become new list price
```

This message displays when a price has not been found on a price list. However, you are warned in both cases when the system has recalculated the net price based on a change to Discount %, and prompted to continue.

Contract Additional Charge Pricing

Pricing for additional items on a contract is similar to contract line-item pricing. In both cases, the system distinguishes between a price found on a price list and one you enter when net price defaults to zero.

- When the list price for the additional charge item is found on a price list, it never changes. If you change the net price, the difference is reflected as a discount.
- When a price is not found on a price list and you enter a net price, any changes to the net price resets the list price. In this case, you must enter a manually specified discount.

Fixed additional charge items can represent either a positive or negative amount, depending on the value for item quantity. However, you cannot update item quantity when there is a percentage additional charge. For a percentage additional charge, the system determines whether the item is an uplift or discount based on the amount type of the price list. If the percentage additional charge is not on a price list, the system applies it as an uplift. If you want a percentage additional charge item to be treated as a discount, define it on a discount price list.

Contract Currency

When you create a contract, you can specify a currency. The currency initially defaults from the currency for the customer bill-to associated with this contract. If the customer has no separate bill-to address, the customer currency is used. You can modify currency only when creating a contract; after the contract is saved, currency cannot be updated.

The contract currency affects pricing for contract-wide additional charges and contract-level limit amounts or list-price limits.

Tip
Limit amounts for a contract type are defined in base currency.

Each end user can have a different currency, if necessary. If you are billing end users (Bill End Users is Yes in the contract header), end-user currency defaults from the end user's bill-to customer record. Otherwise, end-user currency defaults from the contract header.

The system searches for line-item prices using the end-user currency.

Multicurrency and Limit Amounts

How currency affects limits depends on the contract design. For a contract in end-user/item sequence:

- Limits at contract header are in the contract currency.
- Limits at end-user level are in the end-user currency.
- Limits at line detail are in the end-user currency.

For a contract in item/end-user sequence:

- Limits at contract header are in the contract currency.
- Limits at default-item level are in the contract currency.
- Limits at line detail are in the end-user currency.

Exchange Rate

When you enter a non-base currency, the system looks for a valid exchange rate in Exchange Rate Maintenance (26.4), effective on the contract order date. An exchange rate pop-up enables you to specify a spot rate, and to indicate if the exchange rate is fixed or not. By default, the system displays both components of the exchange rate relationship. One of these is the base currency and the other is the contract currency.

For details, see the Multiple Currency chapter in *User Guide Volume 4A: Financials.*

If one or both of the exchange rate components is becoming a member of the European Monetary Union (EMU), triangulation through the euro is used to determine the exchange rate. In this case, the exchange rate relationship includes four components. The fixed rate of the EMU currency to the euro cannot be updated.

This system uses this rate to convert limit amounts from the base currency to the contract currency. When you post the invoice for the contract, the system uses the exchange rate effective on the date of invoice post, unless you have indicated that the exchange rate is fixed.

Contract Currency in Calls

Contract currency has an important effect on related calls and recording activity for them. Only one currency can be valid on a call. Since all the lines on a call must be in the same currency, the contracts associated with a given call must be in the same currency.

You normally specify currency after you begin service activity in Call Activity Recording. However, when you add a line to a call with contract coverage, the system sets the call's currency in Call Maintenance.

If you try to add another item to the call that is covered by a different contract using a different currency, an error displays.

Currency normally defaults from the currency associated with the contract customer's bill-to address. If you override this default in Contract Maintenance, the system warns you, since this may cause problems later if a call for multiple items for this customer is generated.

Multicurrency and Contract Invoicing

If Bill Summary is set to Yes for a contract, the system attempts to summarize information on one invoice. This is either one per end user, when Bill End Users is Yes, or one for the customer bill-to on the header, when Bill End Users is No.

If more than one currency is used on a contract, however, multiple invoices always result. See the section on "Summarized or Detail Billing" for more details.

See "Constraints on Summarized Billing" on page 316.

Multicurrency and Contract Copy and Renewal

You can copy contracts and quotes with any of the following functions:

- Contract Quote Copy from Quote (11.5.1.6)
- Contract Quote Copy from Contract (11.5.1.7)
- Contract Copy to Contract (11.5.13.6)
- Renew Single Contract (11.5.13.8)

The currency of the old contract is copied to the new, unless you specify a different currency for the new contract being created. The new currency must be valid and, for non-base currencies, an exchange rate must exist for the new start date.

Currencies do not often change. The one exception to this is when a country is joining the EMU and is in a transition period from a national currency to the euro. When the old national currency is no longer valid, all documents must be redefined with the euro.

When you specify a new currency, the system replaces the currency for the header and every line that matches the old currency. Any lines with a valid currency that do not match the header are not changed. However, if the line currency is no longer valid, it is always changed to the new header currency. The system displays a message indicating the change.

When you specify a new currency, set Update Prices to Yes to recalculate line prices and limits using the new currency. Make sure you have appropriate price lists set up in this currency or prices default to zero (0). When the exchange rate changes, the system automatically recalculates contract limits and prices.

Contracts and Customer Credit

Contracts are a type of sales order and follow most of the billing rules for sales orders. If the customer bill-to on the contract header is on credit hold, Credit Hold Option in Service Management Control determines processing. This field can have one of three values:

0. Contracts can be created regardless of the customer’s credit status.

1. Contracts can be created, but a warning displays and the system sets the contract’s action status to hold.

2. Contracts cannot be created for customers who are on credit hold. An error message displays, and you cannot create the contract until you set Credit Hold to No in Customer Maintenance. With this setting, if the customer is over the specified credit limit but not yet on hold, the contract can be created. However, a warning displays and the system sets the contract’s action status to hold.

To remove credit holds, update the Action Status field in Contract Maintenance.

Note Credit hold status is checked for the header bill-to address only, regardless of the setting of Bill End Users.

Contract Additional Charges

You can add additional charges to a contract at both the contract and end-user level. The display of frames for defining additional charges in Contract Maintenance depends on settings in Contract Control:

- When End User Additional Charges is Yes in Contract Control, the frame displays for end users.
- When Contract Additional Charges is Yes in Contract Control, the contract-wide frame displays.

Define additional charges in Contract Additional Charges (11.5.7).

Service Type is blank, indicating this charge can be used on any contract.

Fig. 8.6 Contract Additional Charges (11.5.7)

Set up additional charges for a particular contract type by specifying a value in the Service Type field. If you leave Service Type blank, the additional charges are available for use on contracts with any service type.

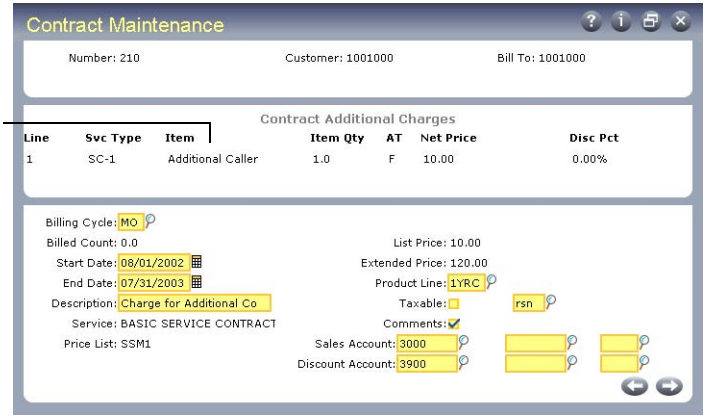
The amount type for an additional charge can be F for fixed amount, the default, or P for percentage. A fixed additional charge represents an amount added to or subtracted from the contract trailer. A percentage additional charge is a markup or discount applied to the total for the items covered on the contract.

To automate pricing, define the prices for additional charge items on a contract service price list. The amount type of the additional charge determines the kind of price list you can define.

See “Prices for Additional Charges” on page 205.

Figure 8.7 illustrates adding an additional charge in Contract Maintenance.

Fig. 8.7
Adding an Additional Charge



Set up the additional charge item, Additional Caller, in Contract Additional Charges with a fixed type. Then, specify it in one of the additional charges frames of Contract Maintenance—either end user or contract wide. The system retrieves its amount type (F) and derives its price from the price list associated with the line. In this case, the price is $10 per month. The system derives the extended price by multiplying the net price by the number of months of coverage, in this case 12.

See “Changing Contract Line Items” on page 263 for details.

When modifying or editing additional charge lines, the system applies the same edits as it does for contract lines.

The total additional charge displays in a separate line on the contract trailer and on the contract invoice. If End User Totals is Yes in Contract Control, the total additional charge for the end user displays in the End User Total frame.

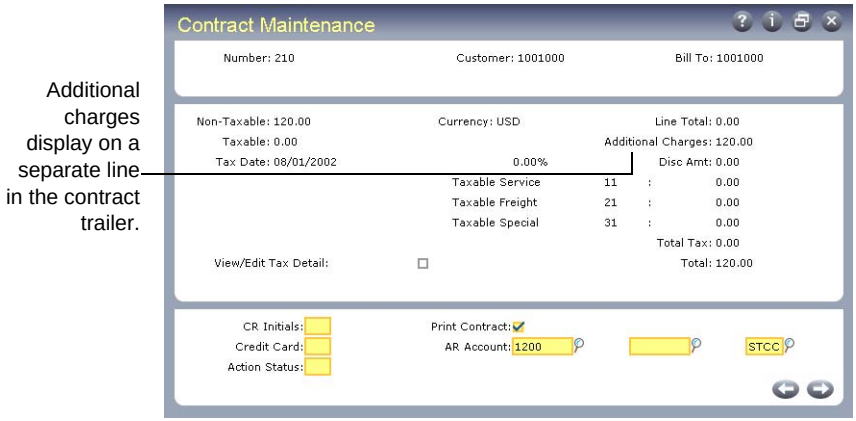


Fig. 8.8
Additional Charge Displays on Trailer

Blanket Coverage

In some business situations, an organization provides a level of coverage to an end user for all products of a certain type. Or, in an even more general case, you might provide coverage to an end user regardless of what product they are using. You can manage these business requirements through blanket contracts.

Blanket contracts are set up slightly differently depending on the value of Item End Users.

- When Item End Users is No, you can specify Yes in the Blanket field in the contract header. This value sets the default for the Blanket field for each end user. When Blanket is Yes for an end user, all of the end-user's items are provided blanket coverage. You can set up some end users with blanket coverage and some without on the contract, regardless of the value of Blanket in the header.
- When Item End Users is Yes, all lines on the contract provide blanket coverage. You cannot modify this setting below the header.

Types of Blanket Coverage

You can define two different kinds of blanket coverage:

- Blanket coverage for a specific item number. To create this kind of blanket contract, add line items to the contract for each item number that is covered. You do not need to specify lot or serial numbers. For lot and serial-number controlled items, the system allows the Serial field to be blank when Blanket is Yes.
- Blanket coverage for any item. To provide blanket coverage for an end user regardless of the items they possess, set Blanket to Yes and add a contract line with a blank item number. This kind of blanket contract provides general coverage for all the end user's items. When you define a global blanket contract, you cannot specify a serial or reference number, and the PM item field is No and cannot be changed.

When the system searches for coverage in Call Maintenance and other call management functions, it looks for contract coverage in this sequence:

- A contract line covering the specific item, lot/serial number, and reference reported by the end user
- Blanket coverage provided for the reported item number
- Blanket coverage all items for the end user on the call

The rules that apply to non-blanket contracts related to overlapping coverage dates do not apply in the same way to blanket contracts. Coverage can exist for a specific item at the same time a blanket contract exists for the same kind of item. The system finds the most specific record first.

Pricing for Blanket Contracts

If you use blanket contracts, think about how you want to price for them. You can set up contract price lists either by item number or by product line. However, the amount you charge for coverage of one item is probably not the same as the amount you would charge for a blanket contract that may cover many items.

To use automated pricing, consider setting up a distinct service type with unique price lists that are used only for blanket pricing. If you enter an item number on a blanket contract line, the system finds the price for that item.

If you are creating a blanket contract that covers all an end user's items, automated pricing can occur only by product line. Since there is no item to establish a product line, the system uses the product line of the service type in searching for a price for a blanket contract with blank items.

Overlapping Coverage

The system does not allow an item to be covered on two different contracts with overlapping coverage dates. But some other types of overlapping coverage are allowed:

- An item can be covered by both a warranty and a contract.
- You can add an item to the same contract more than once if the service type for the two lines is different. You can use this feature to cover an item for a 24-hour day, but provide different terms and conditions, based on different service types, for days and nights.
- An item can be covered specifically on a contract at the same time it is covered by a blanket contract, either for the end user and item combination or for the end user only.

Overlapping Coverage in Calls

When you add an item with multiple coverage sources to a call, you can select the coverage to be used. A lookup lists each coverage source, the start and end dates, service type, whether a contract is a blanket contract, and the hours of coverage. The list is ordered with the more specific coverage sources before the more general ones. This window may display when you create a call or add more lines to it in Call Maintenance or Call Activity Recording.

See "Multiple Sources of Call Coverage" on page 375.

Managing Overlapping Contracts and Warranties

Most customers prefer to let the warranty cover an item for its full duration—after all, the warranty is free. When the warranty expires, a service contract can begin where the warranty left off, perhaps providing even more thorough coverage than the warranty.

Start from Warranty in Contract Control (11.5.24) helps manage the transition from warranty to service contract. If this is Yes, the system attempts to prevent contract and warranty periods from overlapping.

If you set Source to I in Contract Maintenance to use installed base records to add contract lines, the system has information about the warranty start and end dates. If the warranty end date falls after the contract header start date, the system sets the start date for the line item forward to the day following the warranty end date. If you manually enter an item that is covered by a warranty, the system prompts you to change the contract start date and move it forward.

If Start from Warranty is No, the start date for the line-item defaults from the value on the contract header, which may still be within the warranty period.

Some service organizations aggressively market service contracts and may get customers to start more comprehensive contract coverage on an item before the warranty expires. This, in essence, sets up conflicting service dates, since the system is aware of coverage durations. How does the system resolve the overlapping warranty and contract coverage?

If you create a contract for an installed base item still under warranty, the system gives you a warning and offers to change the contract's start date so it follows the warranty's end date. The warning displays when you extend the warranty end date in Installed Base Item Maintenance (11.3.1) and a contract is in effect during the extended warranty.

If you ignore this warning, both the warranty and contract are effective during the overlapping period. Whenever you add an item with more than one source of coverage to a call in Call Maintenance or Call Activity Recording, a lookup displays coverage sources in prioritized order.

See "Changing Charge Codes" on page 454.

The existence of both a valid warranty and a valid contract affects how you can override charge codes in Call Activity Recording.

Contract Start and End Dates

Start dates can be defined at various levels of a contract: the header, default end users or items, detail lines, and additional charges. Start dates defined at one level default to the level below and determine the valid range for lower-level dates, including limit effective dates. All dates must be within the start and end range defined by the header.

In many situations, the start dates on all levels of the contract are synchronized. If you change the start or end date on the contract header, you are prompted to apply this change to each line item.

When you respond Yes to reset the line start dates after changing the header start date, the system updates all lower-level dates that match the old start date. This includes end user and default item dates, as well as detail lines. When the system updates end dates, it modifies the lower-level dates to reflect the contract end date, regardless of whether the dates previously matched.

Note Limit effective dates are not automatically reset; you must do this manually, as needed.

If the changes are not automatically applied to each line, the system verifies that the new header start or end date is not within the range defined by the earliest line start date and latest end date. If it is, the system displays an error message.

There are some limitations on changing contract start and end dates:

- If any open calls reference the contract, the contract start date cannot be moved after any call open date. Correspondingly, the contract end date cannot be moved before any call open date.
- If billing has occurred, you cannot change the contract start date. The end date cannot be set prior to the end date of the coverage period billed.

Contract Line Items

This section discusses a number of issues related to contract line items:

- Generating line items automatically
- Changing line items
- Deleting line items

Automatically Generating Contract Lines

You can enter contract lines manually. However, you can also have the system generate lines based on one of three sources:

- Installed Base. You can create contract line items by selecting from a list of items in the installed base that belong to the current end user.
- Sales Orders. If you specify a sales order number as the source of line items, you can select from the sales order lines. The system creates corresponding contract lines for each item on the sales order selected.
- Sales Quotes. Similar to sales orders, if you specify a sales quote number as the source of line items, you can select from the lines on the sales quote. The system creates corresponding contract lines for each item on the sales quote selected.

When Item End Users is Yes on the contract, creating lines automatically using the Source field changes the sequence of frames slightly. When you are in end-user/item sequence, you specify an end user before the system displays lines from the sales order, quote, or installed base items.

See Figure 8.1 on page 235.

In item/end-user sequence, you normally specify a default item, then an item end user, and then item detail. However, to automatically generate lines, you must specify an end user first.

- When Source is I, you specify one end user and then select items from that user’s installed base.
- When Source is Q or S, you specify a quote or order number, then specify an end user. You can then select lines from the quote or order for this end user. After selecting lines for one end user, you are prompted to specify another. When you press End, the system creates both default item lines and item detail lines for the end users specified.

When the system creates lines, it assumes that values on the header apply to each contract line to be created. This also applies to contract limits; the system assumes that the lines it generates use the coverage limits defined in the header and do not have their own limits. As a result, *you will not be prompted to copy limits into the lines* as you would if you created the lines manually.

One advantage to adding contract lines based on installed base information is that it ensures accurate information. If you manually enter information about installed base items, be careful that lot-controlled items specify a contract line quantity that matches the installed base quantity.

You can add lot-controlled items to the installed base with a quantity of more than one. However, the system cannot distinguish one of these items from another. If you have a contract line for a lot-controlled item that was added to the installed base with a quantity of five, the system suggests this coverage for any one of the five that the end user calls about. This means that you are effectively covering all five for the price of one unit of coverage.

To prevent this, a warning displays when the installed base quantity does not match the contract line item quantity.

Changing Contract Line Items

Service coverage has important implications throughout the system, especially in call-tracking functions. When a call exists that references a contract, the system restricts changes to that line.

Example Item 116, serial 12A is covered on a contract. A call is taken for this item. The contract coverage found by the system determines call defaults like response time and next event date and time. An engineer responds to the call, and reports are opened in Call Activity Recording. Based on the contract limits, the system calculates coverage and generates an invoice.

If the system let you change the serial number on the line in Contract Maintenance, the coverage previously calculated would be invalid.

See “Adding Additional Limit Records” on page 242.

When a contract line is referenced by a call, you cannot:

- Change the line’s service type, item number, serial number, and reference number.
- Delete the line.
- Move the line start and end dates within the range defined by the earliest and latest call open dates referencing the call.
- Add new limits when open reports exist.

Before you can update a contract line referenced on a call, the calls referencing it must be closed and moved to history.

Deleting Contract Line Items

You can delete line items on a contract except when:

- The line has been invoiced. To preserve the integrity of invoice history, the line cannot be deleted. Use Contract Delete/Archive instead.
- A call referencing the contract line exists. Close the call and move it to history. Then you can delete the contract line.

Contracts for End Users with Items

To design a contract for end users with items, set Item End Users to No in the contract header. Figure 8.9 illustrates the various levels of the contract and the components within each level.

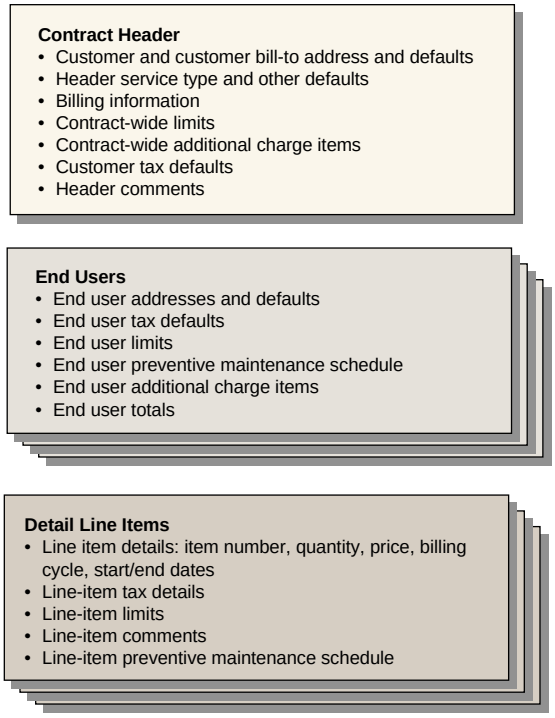

Contract Header
• Customer and customer bill-to address and defaults
• Header service type and other defaults
• Billing information
• Contract-wide limits
• Contract-wide additional charge items
• Customer tax defaults
• Header comments
End Users
• End user addresses and defaults
• End user tax defaults
• End user limits
• End user preventive maintenance schedule
• End user additional charge items
• End user totals
Detail Line Items
• Line item details: item number, quantity, price, billing cycle, start/end dates
• Line-item tax details
• Line-item limits
• Line-item comments
• Line-item preventive maintenance schedule

Fig. 8.9
Contracts for End Users with Items

The basic flow for contracts when Item End Users is No is the following:

1. Enter the contract header. Specify the contract type and other header defaults. When you complete the header, the contract is stored in the database even if you do not enter any line items.
2. If Contract Limits is Yes in Contract Control, optionally copy contract type limits to the contract header.
3. Enter header transaction comments.
4. Specify an end user on this contract and supply end-user default information.
5. If Contract Limits is Yes in Contract Control, optionally copy contract type or contract header limits to the end user.
6. Create end-user line items and specify associated line-item detail.

7 If Contract Limits is Yes in Contract Control, optionally copy contract type, contract header, or end-user limits to the line.

8 Enter line-item comments.

9 View and modify item preventive maintenance (PM) schedule.

Repeat steps 6 through 9 for each line item associated with an end user.

10 If End User Additional Charges is Yes in Contract Control, specify end-user additional charges and any associated comments.

11 View and modify the end-user preventive maintenance (PM) schedule.

12 If End User Totals is Yes in Contract Control, view summary totals for this end user.

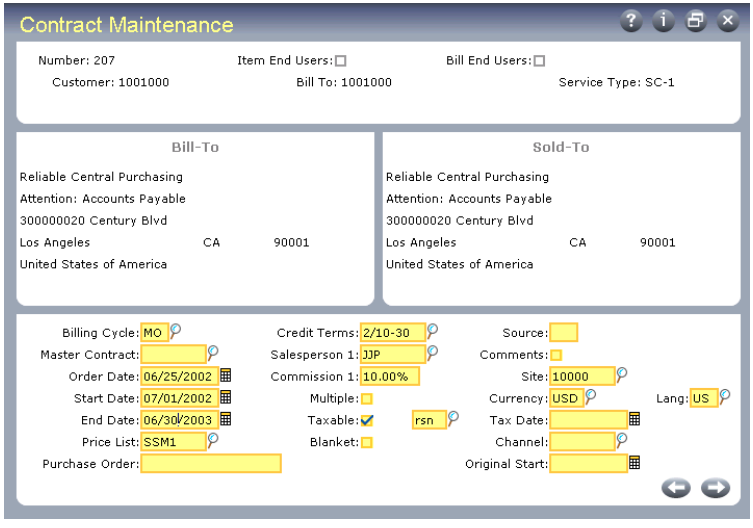
Repeat steps 4 through 12 for each end user on the contract.

13 If Contract Additional Charges is Yes in Contract Control, specify contract-wide additional charges and any associated comments.

14 View contract totals and modify contract trailer information.

Use the following illustrations and field descriptions to understand the details of creating contracts when Item End Users is No in Contract Maintenance (11.5.13.1).

Fig. 8.10 Contract Maintenance (11.5.13.1)



Contract Header

Number. Enter a number uniquely identifying a specific contract and its line items. If you leave this field blank, the system creates the next number using Next Contract Number in Contract Control (11.5.24).

Item End Users. Indicate the relationship between items and end users on this contract:

No: This contract is designed to provide coverage for one or more end users with associated items.

Yes: This contract is designed to provide coverage for one or more items with associated end users.

Tip
This section displays the frame sequence when Item End Users is No.

The value you specify for this field determines the order in which frames display as you maintain the contract. You cannot change this value after a contract has been created. This field defaults from Contract Control.

Bill End Users. Indicate who should receive the invoices generated for this contract by Billing Release to Invoice:

See “Billing Customers or End Users” on page 314 for more details.

No: Only one billing address, specified in the contract header, is associated with the contract. Billing Release to Invoice generates all contract invoices to this address.

Yes: Multiple billing addresses can be associated with the contract, one for each contract end user. At least one invoice is generated in Billing Release to Invoice for the bill-to address associated with each end user defined on the contract.

Note The invoice for contract-wide additional charges is always sent to the header billing address, regardless of the value of Bill End Users.

When Bill End Users is Yes, each end user you specify must be defined in Customer Maintenance. The end-user bill-to address defaults from the end-user customer record, not from the header.

This field defaults from Contract Control.

Customer, Bill To. Enter a valid customer defined with Customer Address Maintenance. The Bill To value defaults from the customer record.

Service Type. Enter a valid contract type defined in Contract Type Maintenance. The value specified determines the default service type for each contract line.

Tip
Set up billing cycle codes with Billing Cycle Code Maintenance (11.5.18.1).

Billing Cycle. Enter a code indicating how often to bill lines on this contract. This field defaults from the Default Billing Cycle value in Contract Control, but you can change it to another valid billing cycle.

The header billing cycle defaults to the next contract level, either default items or end users, based on the value of Item End Users.

You can accept the default or specify a different billing cycle code at various levels below the contract header. However, you cannot specify a cycle that indicates less frequent billing than the cycle specified on the header. For example, the header billing cycle is annual. You cannot specify a billing cycle of every two years for a contract line.

Master Contract. Service contracts can be set up in a hierarchy, with one contract linked to another. For example, you can link a contract for each piece of equipment in an installation to the master contract for the entire installation. In this case, enter the master contract number in this field. The master contract number can be used later as a filter when printing contracts.

Order Date. Order date defaults from the system date and is a reference-only field.

For more details on start date, see “Contract Start and End Dates” on page 261.

Start Date. Enter the first date that contract terms and conditions become effective. After you create the contract, the system does not recalculate the start date, even if you change the order date later.

This field defaults to the first of the month following the system date.

If you change the header start date and line items exist on the contract, you are prompted to override the start dates for each line. Respond Yes to update all lines that previously matched the contract start date. You cannot move the start date inside the range defined by limit effective dates or change it after the contract has been invoiced.

End Date. The system adds the duration of the service type to the start date to calculate the end date. Although you can add new line items at any time to an existing contract, no end-of-coverage date can go beyond the contract header’s end date.

If the header end date is changed and line items exist on the contract, you are prompted to override the end dates for each line. Respond Yes to update the contract lines. However, you cannot move end dates inside the range defined by limit effective dates.

Price List. Enter a code identifying a type C (contract) price list to use for this contract. Price list defaults from the Contract Price List field on the service type in effect. The header price list is used to price contract-wide additional charge items. You can change the price list at any time. However, the new price list affects only new records added to the contract; existing prices are not recalculated.

The line-item price list is determined by the service type associated with the detail line.

Purchase Order. Specify a purchase order number for this contract. This field is required if the customer has been defined to require purchase orders in Customer Maintenance (2.1.1).

Credit Terms. Enter the credit terms code that applies to this contract. Credit terms default from the header bill-to address.

Salesperson. Enter the salesperson to receive a commission and quota credit for this contract. Salesperson defaults from the customer. The salesperson information on each line item defaults from the salesperson and commission rate entered on the header. You can change commission on each line item.

Commission. Enter the commission percentage this salesperson is to receive.

Multiple. Indicate if more than one salesperson is responsible for this customer order. If Yes, a pop-up window prompts you to enter up to four salespersons and corresponding commissions when you exit this frame.

Taxable. Enter Yes if the items on this contract are subject to tax; otherwise, enter No. Header tax fields default from the contract customer. If Item End Users is No, you can also update tax fields for each end user. End-user tax fields default from End User Address Maintenance and set the default for lines.

See “Blanket Coverage” on page 257.

Blanket. Enter Yes if some items on the contract have blanket coverage. Otherwise, enter No. After the contract has been saved, you cannot change this value.

This field sets the default for the same field associated with end users on the contract. Blanket must be Yes for the end user for blanket coverage to be applied. You can set up some end users with blanket coverage and some without on the contract, regardless of the value of Blanket in the header.

For details on this option, see “Automatically Generating Contract Lines” on page 262.

Source. The code in this field tells the system where to look for items to be included on the contract. The possible choices are I (installed base), S (sales orders), Q (sales quotation), and M or blank, indicating you will enter line items manually, rather than selecting them from a list.

Comments. This field defaults from Service Header Comments in Contract Control. If Yes, a page appears for recording or retrieving master comments associated with the contract. After you select or enter comments, you can specify when you want them to print.

Site. This field defaults from Contract Site in Contract Control and indicates the site responsible for supporting this contract. This is usually the site where repairs are done or repair parts are found. Item costs are based on the contract site, and GTM tax zones use the site address as the From value.

See “Contract Currency” on page 251.

Currency. Enter the currency for this contract. Currency defaults from the bill-to address.

- When Bill End Users is No, the header currency sets the default for each end user.
- When Bill End Users is Yes, currency at the contract-line level defaults from the bill-to address associated with the end user, not the contract header.

Each end user can have a different currency, if needed.

See “Constraints on Summarized Billing” on page 316.

Note When different currencies are used, separate invoices are generated for each currency even when Bill Summary is Yes.

You can modify this value on a new contract only. After the contract has been saved, currency cannot be changed.

Contract currency sets the currency of a call for covered items. When a non-base currency is entered, an exchange rate pop-up lets you override the effective exchange rate and indicate if it is fixed or not.

See “Contract Currency in Calls” on page 253.

Language. Language defaults from the contract customer. Language enables you to print comments on an invoice in the language appropriate for the receiver.

Tax Date. Enter the effective date associated with the tax code entered previously.

Channel. Enter an optional code identifying the distribution channel through which this contract originated. Channel can be a factor in determining default GL sales and sales discount accounts affected when you post the contract invoice.

Tip
To standardize usage, set up values for field so_channel in Generalized Codes Maintenance.

You can modify the default sales and sales discount accounts in Contract Maintenance only when Modify Sales Accounts is Yes in Contract Control.

Original Start. This field is blank unless the contract has been renewed.

Second Header Frame

Many of the fields in the second header frame default from Contract Control (11.5.24).

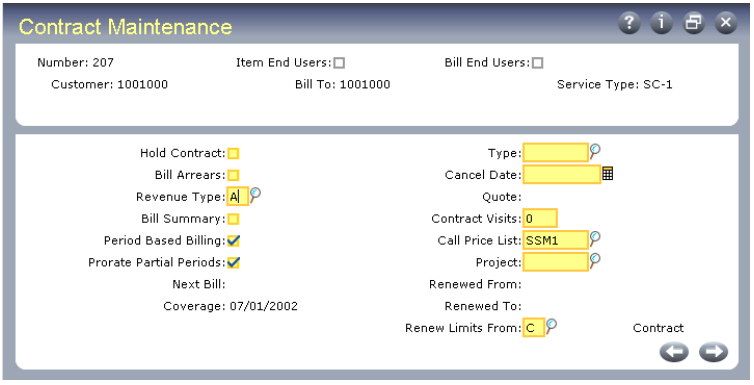


Fig. 8.11 Contract Maintenance, Second Header

Hold Contract. If Yes, this contract will not be released for billing. This is useful if the price for the contract is still in negotiation and is not finalized with the customer.

See “Contract Quotes” on page 307 for details.

A contract on hold can still be used to provide coverage for service activities as in Call Maintenance. If the contract should not be considered valid for coverage, use the contract quotation process instead.

Tip
The setting of Bill Arrears affects the valid contract revenue types.

Bill Arrears. If No, the customer is billed in advance for contract coverage. If Yes, the customer is billed for periods that have already passed—Next Bill defaults to the first day of the next billing period. This field defaults from the Bill Arrears field in Contract Control (11.5.24). You cannot modify it after a contract has been invoiced.

See “Managing Deferred and Accrued Revenue” on page 317 for more details.

Revenue Type. Enter the revenue type code to use when billing this contract. Valid values are A (Accrued Revenue), C (Cash Basis), or D (Deferred Revenue). The default is set in Contract Control. Validation depends on the setting of Bill Arrears.

Cash Basis: To post revenues upon receipt for this contract, set Revenue Type to C. In cash-basis accounting, revenue is recorded in the period it is actually received.

Accrued Revenue: To accrue revenue for this contract, set Revenue Type to A. Bill Arrears must be set to Yes. In accrual-basis accounting, revenue is recorded in the period in which it is earned, regardless of whether cash is received in that period. Run Revenue Recognition (11.5.18.21) to accrue amounts, usually monthly.

Deferred Revenue: To defer revenue for this contract, set Revenue Type to D. Bill Arrears must be set to No. Perform the normal invoicing procedure at the beginning of the contract coverage period. Collected revenue is held in a deferred account and is posted periodically over the contract duration when you run Revenue Recognition.

See “Summarized or Detail Billing” on page 315 for the full effect of this setting.

Bill Summary. Enter Yes to invoice this contract in summary format; otherwise, enter No. This field defaults from Contract Control.

When Bill Summary is Yes, the details that are not printed on an invoice are stored in the database. You can view these details using Billing Detail Report (11.5.18.14).

The setting of Bill Summary interacts with Bill End Users and Item End Users.

Period Based Billing. Indicate whether contract billing is synchronized with calendar months:

For details, see “Period Based Billing” on page 312.

Yes: Invoicing begins on the first day of the next calendar month, regardless of the start date of the contract. For example, a contract with a start date of January 23 is billed starting on February 1.

No: Billing periods for contract invoices use the actual start date of the contract header and line, without synchronizing to the start and end days of the month. A contract on a monthly cycle starting on January 23 is billed on January 23, February 23, March 23, and so on, assuming Bill Arrears is No.

Period Based Billing works in conjunction with Prorate Partial Periods.

Prorate Partial Periods. Indicate how the system should invoice for coverage periods that are less than a complete month:

For details, see “Prorating Partial Periods” on page 313.

Yes: Invoices are generated for partial periods based on the percentage of a month the partial period represents.

No: When Period Based Billing is Yes, partial periods are essentially given away free and no invoice is generated for them.

If Period Based Billing is Yes, partial periods are likely to occur. You can use the Prorate Partial Periods field to ensure that any partial periods are included in invoicing. If Period Based Billing is Yes and Prorate Partial Periods is No, any days in the partial period prior to the beginning of the month are essentially given away free.

Next Bill. This system displays the next date when an invoice should be generated for this contract. This field normally should not be changed and cannot be updated in Contract Maintenance. If necessary, use Billing Date Correction (11.5.18.19) to change the next billing date.

See “Correcting a Posted Invoice” on page 329.

Billing Release to Invoice selects contracts for billing based on the header Next Bill date.

When a contract is created, this field is set based on the value of Bill Arrears:

- When Bill Arrears is No, Next Bill is the start date of the contract.
- When Bill Arrears is Yes, it is the day after the first billing period.

After it is initially set, Next Bill is updated by Billing Release to Invoice.

Coverage. The system displays the date when service coverage becomes effective for the next billing period, to be billed on the date recorded in Next Bill Date.

See “Correcting a Posted Invoice” on page 329.

This field is updated automatically by Billing Release to Invoice (11.5.18.13) and Billing Reversal Maintenance (11.5.18.18). This field normally should not be changed and cannot be updated in Contract Maintenance. If necessary, use Billing Date Correction (11.5.18.19) to change the value.

Type. This field is used for reference only. It is a user-defined grouping code that can be set up in Generalized Codes Maintenance for the field *sa_sa_type*.

Cancel Date. If the contract is canceled, you can enter a date here for reference.

Quote. If you generated this contract by releasing a quote, the quote number displays here for reference.

See Chapter 10, “PM Scheduling,” on page 335.

Visits. Enter the number of preventive maintenance (PM) visits to be scheduled for each end user on this contract.

You can update this field only when Item End Users is No. When Item End Users is Yes, you can set up PM schedules for individual items, but not for end users.

Entering any non-zero number activates PM scheduling for each end user on the contract. After you enter detail items for each end user, the system displays the End User PM Schedule, which lists the system-scheduled dates for the visits.

See “Scheduling Visits for a Line Item” on page 338.

The end-user schedule is in effect for all of the end user’s items that have PM item set to Yes and do not have individual schedules created for them. If you leave the header Visits field blank, you can still create preventive maintenance schedules for individual contract details.

Project. Enter an optional code identifying the default GL project associated with this contract. If you specify a value, it defaults to lower levels of the contract, either end users or items.

GL transactions created during contract billing reference entity, account, sub-account, cost center, and project. If Verify GL Accounts is Yes in System/Account Control, each component you enter must be valid on its own and in combination with other account number components.

Call Price List. Enter the call price list code to use for items covered by this contract. You must enter a type R (repair) service price list set up with Service Pricing Maintenance (11.17.1). This fields defaults from the service type associated with the contract.

When a call is taken for an item covered by this contract, the call price list defaults to the call. Repair price lists specify prices for items consumed in a service activity, as well as for labor and expenses recorded in Call Activity Recording (CAR).

Call price lists also determine:

- Credits for items exchanged in CAR, based on the exchange UM
- Fixed prices, based on the fixed price UM

Note Define Exchange UM and Fixed Price UM in Call Management Control (11.1.24).

If you set up an expense cost price list (type E) with the same code as the call price list, CAR also accesses that list to determine standard costs for expense items.

Renewed From, Renewed To. If this contract was renewed from a different contract, the number displays in the Renewed From field. If this contract formed the basis of another through the renewal process, this number displays in the Renewed To field.

Renew Limits From. This field defaults from Renew Limits From in Contract Control. The system examines this value when a contract is renewed or copied to determine how to manage limits:

Tip
This field has no effect if Contract Limits is No in Contract Control.

- C (contract). The system copies the current limits from the contract and modifies the effective dates to match the new contract's start and end dates.
- S (service type). The system copies limits from the service type, applying limits effective on the new contract's start and end dates.

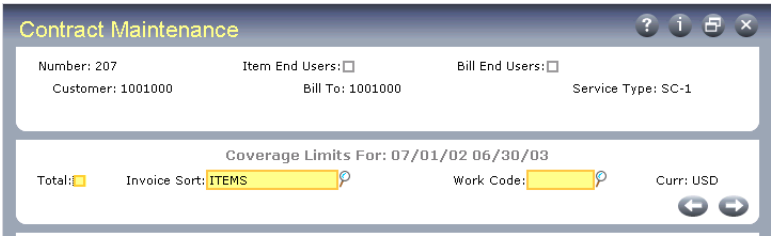
Header Coverage Limits

If Contract Limits is Yes in Contract Control, you can modify the limits associated with the contract service type, at all levels of the contract. If this field is No, the system uses the limits defined for the contract type. They are neither displayed nor modified.

If Contract Limits is Yes, you are prompted to copy service type limits. If you respond Yes, the system copies the limits defined for the contract type being used into the header. If you respond No, limits are not copied. You can set up new limits in the contract or define them at the line level.

After you respond to this prompt, the Coverage Limits frame displays.

Fig. 8.12
Header Coverage Limits Frame



See “Levels and Limits of Service” on page 170.

If you copied the service type limits, you can view or modify them in this frame, which is the same as the one used to set up coverage limits in the service type.

If you have posted any amounts against limits defined on a contract or recorded any amounts against the limits in Call Activity Recording, they display in the Used/Consumed field. You cannot update this field manually. The system updates it when invoices are posted.

See page 247 for details on these reports.

Note Use Limits Consumption Inquiry and Limits Consumption Report (11.5.13.21.4 and 11.5.13.21.5) to view consumed (posted) amounts and used (unposted amounts recorded in CAR) separately.

End User Default

After completing header limits, you specify an end user with items on the contract.

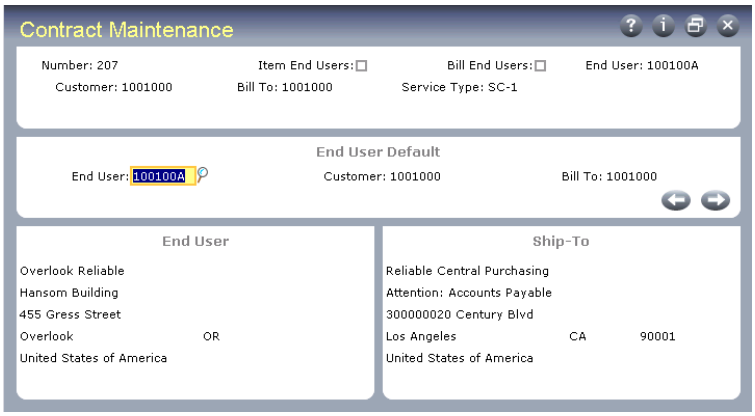


Fig. 8.13
End User Default, Address Frames

End User. Enter the address code of an end user with associated items. Address information of this end user displays.

This field is validated differently depending on the setting of Bill End Users:

- When Bill End Users is No, enter an existing or new end-user address code. If the address does not exist, you are prompted to create it. Customer and bill-to default from the header, and you cannot change them.
- When Bill End Users is Yes, enter an address defined as a customer in Customer Maintenance. If the customer is not also defined as an end user, you are prompted to create the end-user record. The end-user customer and bill-to default from the end-user customer record. You can modify the end-user bill-to as necessary.

Bill To. When Bill End Users is Yes in the contract header, enter the address code assigned to the bill-to location for this customer. This field defaults from the end user's customer record if a bill-to address has been defined in Customer Maintenance.

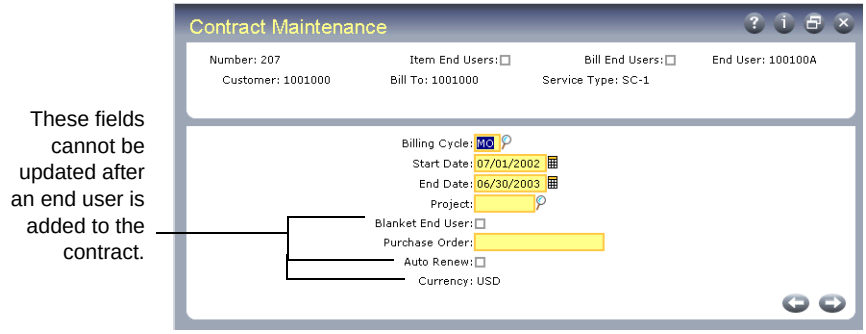
See "Billing Customers or End Users" on page 314.

End User Default

Use this frame to modify defaults associated with the end user.

Note When you create contracts with Item End Users set to Yes, you specify only a subset of the fields you specify here: Project, Auto Renew, Currency.

Fig. 8.14
End User Default



Billing Cycle. Specify a billing cycle for the end user, which then defaults to the end user's line items. The line-item billing cycle determines actual billing frequency. The end-user billing cycle cannot be more frequent than the contract header.

Start Date and End Date. Enter the default start and end dates for line-items associated with this end user. End-user dates must be within the range defined by the header start and end dates.

Project. Enter a default project for line-items associated with this end user.

Blanket End User. Enter Yes if this contract provides blanket coverage for items associated with this end user. Otherwise, enter No. This field defaults from the setting of Blanket on the contract header. After you have created a line for an end user, you cannot change this value.

You can set up some end users with blanket coverage and some without on the same contract, regardless of the value of Blanket in the header.

Purchase Order. Enter this end user's purchase order (PO) number, if applicable. Whether this field is required depends on the value of the PO Required field in End User Address Maintenance (11.9.1).

Auto Renew. This field defaults from the value for the end user in End User Address Maintenance (11.9.1). If Yes, the system includes contract lines for this end user when you run Renewal Process/Report (11.5.13.10). You cannot update this field after the end user is added.

See "Renewing Contracts Automatically" on page 304.

Currency. Enter the currency for this end user. If Bill End Users is No, currency defaults from the contract header. If Bill End Users is Yes, currency defaults from the end-user bill-to address. The system searches for line-item prices using the end-user currency. You cannot update this field after the end user is added.

See "Contract Currency" on page 251 for details on multiple currency contracts.

End User Coverage Limits

If Contract Limits is Yes in Contract Control, you are prompted to copy limits to the end user. If you previously copied limit detail into the contract header, you can copy limits from the header or the contract type.

The limit screen is the same as the one used for contract header limits.

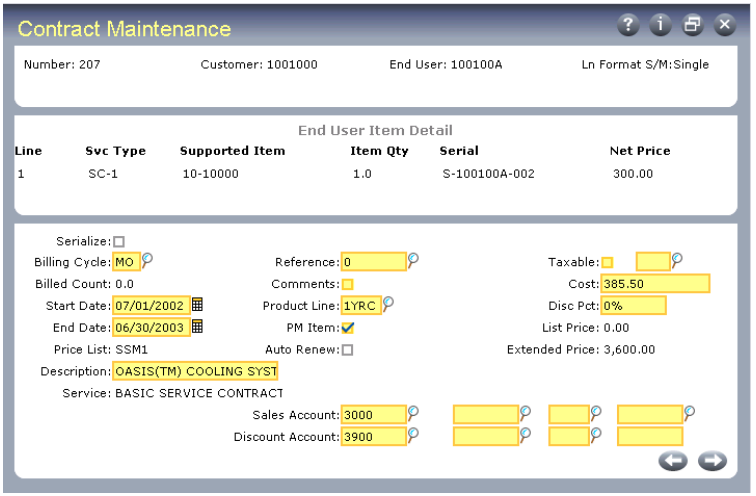
See "Header Coverage Limits" on page 276.

Entering End User Item Details

Each end user on a contract can have multiple items, each with a different service type. The line-item service type overrides the header service type. For example, specifying a different service type might bring in a different price list or change the level of coverage. If you change the service type, you are prompted to update the price from the new price list.

If you specified a source for items earlier, the system creates detail line for the items you selected.

Fig. 8.15
End User Item Detail



Line. Enter a number identifying a detail line or leave blank for a system-generated number. Line numbers can be up to 5 digits.

Service Type. Service type defaults from the header, but can be changed. If you modify it, the system uses the price list from the new service type for this item, and you can copy the service limits associated with the new service type if no amounts were accumulated against the current limits.

Tip
After you save a line, you cannot change the item number; you must delete the existing line and add a new line with the other item number.

Item. Enter the number of an item to be covered by this contract. Items are validated according to the setting of Items Must Exist in Service Management Control and Items in Installed Base in Contract Control.

An item can be covered only by one contract at a time. When a call is taken for an item, the system searches first for contract lines for the specified item, serial, and reference. If they exist, the system uses the contract's terms and conditions for coverage.

Item Qty, Serial. Enter the number of items covered on this contract line. If the Item Qty is 1 and this is a serialized item, enter the serial number that uniquely identifies it. If the Item Qty is greater than 1 and this is a serialized item, leave Serial blank and specify Yes to the Serialize field in the detail. You can then enter multiple serial numbers in a pop-up window.

If the item is serial-number controlled in Item Master Maintenance (1.4.1), a serial number is required unless this is a blanket contract.

Net Price. This field defaults from the price list in effect; otherwise, it is zero. You can change the price. If the net price does not default to zero, List Price is set from the Net Price and never changes. The system considers any change to the net price a discount and displays it in the Disc field in the item detail. Increasing the price creates a negative discount; decreasing it a positive discount.

Tip
Control price update through field security.

If the price defaults to zero and you enter a price, the system considers it to be the list price of the item. If you change the net price later, list price is recalculated.

See “Contract Line Pricing” on page 250 for details.

The net price indicates the price per unit for one month of coverage for this item. The system calculates the extended price for an item by multiplying the item quantity by the net price per unit by the number of periods of coverage—contracts are measured in months. For example, if one item is covered at a price of $10 per month for 12 months, the extended price is $120.

Line-Item Detail

Serialize. Enter Yes in this field if the line item is serial or lot-controlled and quantity is greater than 1. In this case, Serialize defaults to Yes. Specifying Yes displays a pop-up that enables you to enter individual serial or reference numbers for each item on the line. If you designate an item as lot or serial number controlled in Item Master Maintenance, enter a number for each item on the contract.

Billed Count. The system displays the total number of months that have been billed through Billing Release to Invoice.

Start Date and End Date. These fields default from the end user. Each line item can have a unique start and end date for coverage, although these cannot be outside the range defined by the end-user start and end dates.

Tip
If you change the service type on the line item, the contract price list associated with the new service type displays.

Price List. The system displays the price list used to calculate the line-item price. If you change the service type for a line item, the price list associated with that service type is used; otherwise, the price list from the contract header is used. This is normally the price list associated with the contract type specified on the header, but it might have been changed at the header level.

Description. The inventory description of the line item being covered displays and can be modified.

Service. The description of the service type entered in Contract Type Maintenance (11.5.10) displays and cannot be modified.

Reference. Specify an ISB reference number that uniquely identifies this item. Reference numbers uniquely identify items in the installed base without serial numbers or that are part of a lot. Enter ? (question mark) for the next system-supplied reference number.

If Items In Installed Base is Yes in Contract Control, the combination of item number, lot or serial number, and ISB reference number must exist in the installed base for this end user or an error displays.

Comments. This field defaults from the value of Service Line Comments in Contract Control. Specify Yes to enter comments for this line item.

Product Line. The product line associated with either the service type or the item displays by default. The value depends on Use Item Prod Line in Service Management Control (11.24). The system uses the accounts of this product line for recording revenue from the sale of this contract for the associated line item.

See “Revenue Accounts” on page 318.

Note Deferred and Accrued Revenue accounts are always found using the product line of the service type, since they exist only at the contract header level.

Tip
If you do not specify a different number of visits for this item, it is included on any end-user schedule.

PM Item. Enter Yes to schedule preventive maintenance (PM) visits for this item. If Days between PM is any nonzero value in Service Item Maintenance (11.3.7), this field defaults to Yes.

When PM Item is Yes, the Preventive Maintenance Detail pop-up displays, enabling you to specify the number of visits to be scheduled for this item. When PM Item is No, this item is not included on the PM call generated for an end-user PM schedule.

Taxable. This field defaults from the end user. Each line item can have a different taxable status.

Cost. Cost defaults from the contract site specified on the header multiplied by the item quantity. If costs are not set up at this site, cost is zero. This field is security restricted. This field is for reference only and is not used in any contract margin calculations.

Disc Pct. The system calculates and displays a discount if the item's net price was derived from a price list, setting the list price, and then changed. You can enter a manual discount, causing the system to recalculate the net price from the price list or the net price you entered earlier.

List Price. Output-only field. If the system found the net price from a contract price list, List Price is the initial net price. If Net Price defaulted to zero, the system sets List Price to the amount you entered for Net Price during the last edit session. In this case, List Price changes whenever you change Net Price.

Extended Price. The system calculates this by multiplying the item's net price by the number of items and the number of months of coverage.

Sales and Discount Account, Sub-Account, Cost Center. The system displays the Sales and Sales Discount Accounts for this contract line. These fields can be modified only if Modify Sales Accounts is Yes in Contract Control.

Sales and Discount Project. Enter an optional code identifying the GL project associated with the sales and sales discount amounts for this contract line. These fields default from the header. The sales and discount projects are typically the same.

The sales and sales discount projects default to the same fields in Call Activity Recording when service is provided for this item.

If Verify GL Accounts is Yes in System/Account Control, the system verifies that the project exists and is active and that it is valid with the other sales account components.

Preventive Maintenance Detail

See “Scheduling Visits for a Line Item” on page 338.

If PM Item is Yes, a preventive maintenance detail pop-up displays. It shows the default number of visits for the end user. You can change the value for this line item.

Contract Accounts Pop-Up

If Display Contract Accounts is Yes in Contract Control, a pop-up window displays the Sales and Sales Discount accounts and cost centers being used and lets you modify them.

Item Detail Coverage Limits

If Contract Limits is Yes in Contract Control, the system again prompts you to copy service limits when you finish entering a line item. If you respond with Yes, you are then prompted to copy limits. You choices depend on how you responded to previous prompts:

- If end-user limits exist, you can copy these or from the service type.
- If end-user limits do not exist and header limits do, you can copy from the header or the service type.

If you set up limits for the line item, amounts accumulate against these limits, not limits at the end-user or contract-header level.

See “Header Coverage Limits” on page 276.

The limit screen is the same as the one used for contract header limits.

PM Schedules

See Figure 10.5 on page 342.

If PM Item is Yes for the line item and a separate schedule exists for the item, the PM Schedule for Line: n displays the scheduled dates. When you press Go after confirming these dates, the End User PM Schedule frame displays if an end-user schedule exists.

End User Additional Charges

See “Contract Additional Charges” on page 255.

If End User Additional Charges is Yes in Contract Control, you can associate additional charge items with each end user. These items are defined in Contract Additional Charges (11.5.7). Each charge is added as a separate line item with its own pricing information.

Adding additional charges is similar to adding contract items, with some exceptions. Only the fields that differ are described.

Additional charges appear in a separate section of the printed contract.

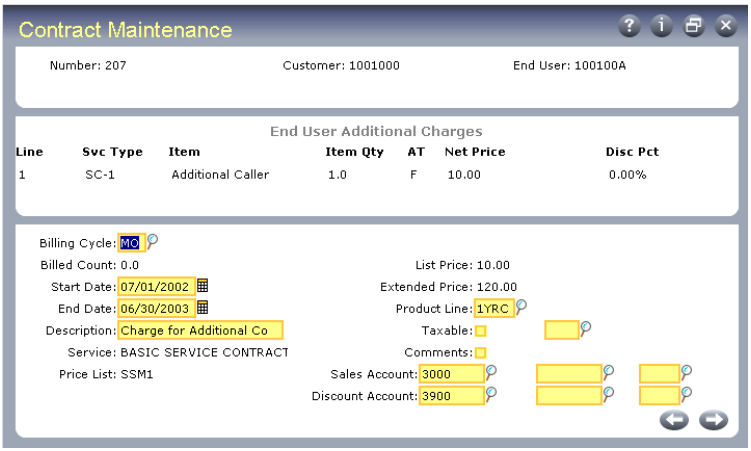


Fig. 8.16 End User Additional Charges in Contract Maintenance

Item. Enter an additional charge item set up with Contract Additional Charges for use with the current service type or with all service types.

Item Qty. This field is editable only if the additional charge item has an amount type of F (fixed). In this case, quantity specifies the number of fixed fees to be added. A negative quantity indicates an amount to be subtracted from the contract total.

For example, you may have a fixed fee for an additional caller and enter a quantity of 3 for three additional callers. Or you may provide a site discount based on the number of sites. In this case you could enter –3 to provide a discount amount for three sites.

If the additional charge item is an amount type of P, Item Qty cannot be edited. The system determines whether the percentage is a discount or markup based on the amount type of the price list used. If a price does not exist on a price list, a percentage additional charge is treated as an uplift.

AT. This output-only field displays the amount type from the definition of the additional charge item: either F (fixed) or P (percentage).

- A fixed price additional charge is an amount added to or subtracted from the contract trailer.

- A percentage additional charge is a markup or discount applied to the total for the items covered on the contract.

Tip
Price update can be controlled through field security.

Net Price. This field defaults from the price list in effect; otherwise, it is zero. Define contract price lists with Service Pricing Maintenance. You can change this value. If the net price does not default to zero, List Price is the net price. The system considers any change to the net price a discount and displays it in the Disc field in the item detail.

If the price defaults to zero and you enter a price, the system considers it the list price of the item but recalculates list price if you change the net price.

Tip
Press Go at the Discount field for the system-calculated amount to display.

Disc Pct. The system calculates and displays a discount when the item's net price was derived from a price list—setting the list price—and then changed. You can also enter a discount manually, causing the system to recalculate the net price from the price list or the net price you entered, after you press Go to continue.

When you enter a positive discount, the system applies it so the customer benefits from a lower price. In the case of percentage additional charges, this works slightly differently depending on whether the charge is an uplift or a discount.

When you have an uplift additional charge and enter a positive discount, the net price decreases; if you enter a negative discount, the net price increases. Conversely, when you have a discount additional charge and enter a positive discount, the net price increases to provide a greater discount to the customer; if you enter a negative discount, the net price decreases.

Billing Cycle. The billing cycle does not apply to percentage (type P) additional charges. The percentage is applied to every amount billed, regardless of the billing cycle.

End User Total

If End User Totals is Yes in Contract Control, the following frame displays with summary information about the detail lines for this end user.

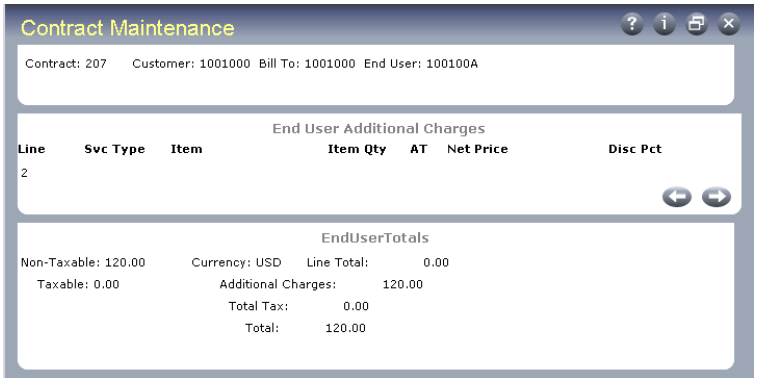

Contract Maintenance
Contract: 207 Customer: 1001000 Bill To: 1001000 End User: 100100A
End User Additional Charges
Line Svc Type Item Item Qty AT Net Price Disc Pct
2
EndUserTotals
Non-Taxable: 120.00 Currency: USD Line Total: 0.00
Taxable: 0.00 Additional Charges: 120.00
Total Tax: 0.00
Total: 120.00

Fig. 8.17
End User Total in Contract Maintenance

The fields in this frame are similar to those that display in the contract trailer, but apply to amounts for the current end user only.

End User Default

After you complete an entire sequence for one end user, the End User Default frame displays for input of another end user with items on this contract. Enter another end user or press End to complete the contract.

See “End User Default” on page 277.

Contract Additional Charges

If Contract Additional Charges is Yes in Contract Control, you can associate additional charge items with the contract. Each charge is added as a separate line item with its own pricing information.

When Bill End Users is Yes, a separate invoice is generated for the contract header customer for contract-wide additional charge items, since these apply to the entire contract.

If you plan to renew contracts by end user, you should be careful about adding fixed additional charges to the contract.

Important When you renew parts of a contract, any contract-level additional charges are applied to each contract generated, with amounts unchanged. You many need to adjust a fixed-amount charge.

This same warning applies to releasing contract quote lines by end user.

See Figure 8.16 on page 285.

The Contract Additional Charges frame is the same as the End User Additional Charges frame.

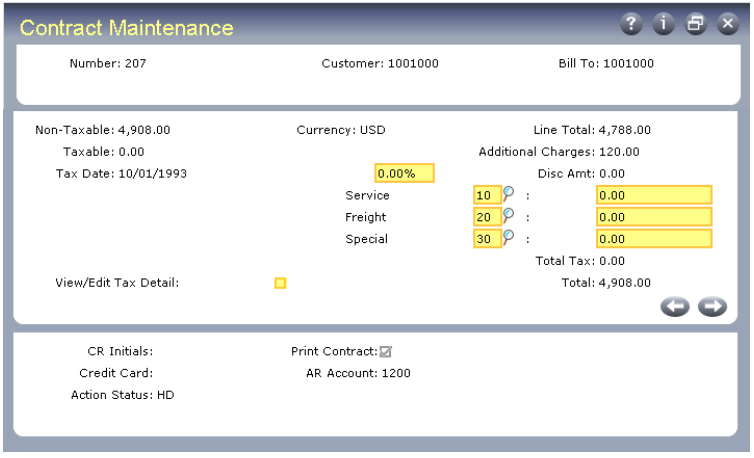
Contract Trailer

The contract trailer is similar to that of a standard sales order. The Line Total field is the sum of the extended prices for each line item. The Additional Charges field displays the total of either fixed or percentage uplift additional charges. You can add an overall discount percentage here for the entire order, along with miscellaneous charges.

Taxable and nontaxable trailer codes default from Contract Control, if defined.

The Total field represents the total billable amount on the contract. This may be divided among end users if Bill End Users is Yes. Billing may occur at one time, or the invoice amount may be divided, depending on the contract billing cycle—yearly, quarterly, monthly.

Fig. 8.18 Contract Maintenance Trailer



Cr Initials, Credit Card. Enter optional user-defined codes defined with Generalized Codes Maintenance.

Action Status. If the header customer is on credit hold, HD displays in the action status field. The effect of this status depends on Credit Hold Option in Service Management Control.

See “Contracts and Customer Credit” on page 254.

Print Contract. This field defaults from Print Sales Contracts in Contract Control and indicates whether the contract should be printed. Contract Print includes only contracts with a Yes in this field and sets the field to No when an entire contract is printed successfully in one execution.

Tip
If you want to reprint a contract, reset this field to Yes.

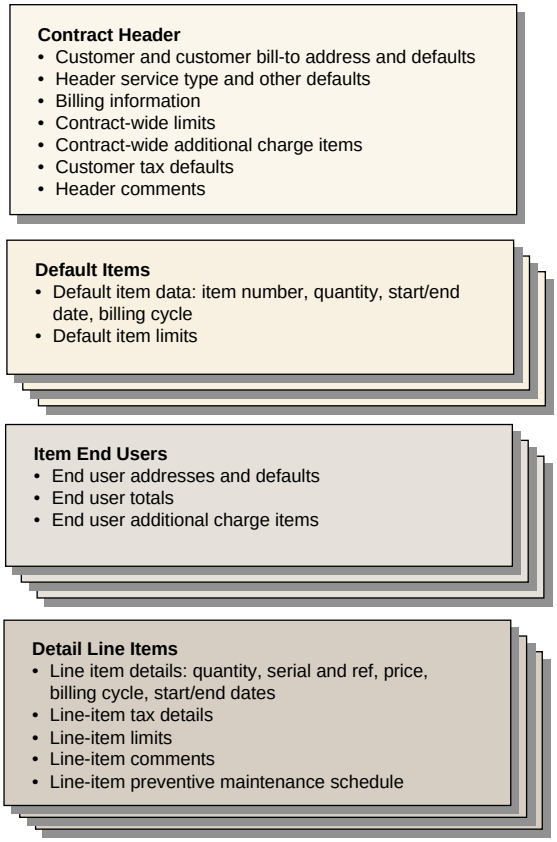
Note If you print only sections of a contract, for example, only lines for a particular end user, this field is never set to No by the system.

AR Account, Sub-Account, and Cost Center. Defaults from the customer bill-to record associated with the contract and indicates the GL account tracking accounts receivable amounts. When you post an invoice, the system debits the total invoice amount, including add-on charges and taxes, to this account.

Contracts for Items with End Users

To design a contract for items with end users, set Item End Users to Yes in the contract header. Figure 8.19 illustrates the various levels of the contract and the components within each level.

Fig. 8.19
Contracts for Items with End Users


Contract Header
• Customer and customer bill-to address and defaults
• Header service type and other defaults
• Billing information
• Contract-wide limits
• Contract-wide additional charge items
• Customer tax defaults
• Header comments
Default Items
• Default item data: item number, quantity, start/end date, billing cycle
• Default item limits
Item End Users
• End user addresses and defaults
• End user totals
• End user additional charge items
Detail Line Items
• Line item details: quantity, serial and ref, price, billing cycle, start/end dates
• Line-item tax details
• Line-item limits
• Line-item comments
• Line-item preventive maintenance schedule

The basic flow for contracts when Item End Users is Yes is the following:

1. Enter the contract header. Specify the contract type and other header defaults. When you complete the header, the contract is stored in the database even if you do not enter any line items.
2. If Contract Limits is Yes in Contract Control, optionally copy contract type limits to the contract header.
3. Enter header transaction comments.
4. Specify a default item on this contract and supply item default information.
5. If Contract Limits is Yes in Contract Control, optionally copy contract type or contract header limits to the default item.

6 Specify an end user who owns specific instances of this item and supply default end-user information.

7 Create detailed line items for this end user.

8 If Contract Limits is Yes in Contract Control, optionally copy contract type, contract header, or default item limits to the line.

9 Enter line-item comments.

10 View and modify item preventive maintenance (PM) schedule.

Repeat steps 7 through 10 until all instances of this item are added for this end user. Repeat lines 6 through 10 until all end users who own this item are added. Repeat steps 4 through 10 until all items are added to the contract.

11 If End User Additional Charges is Yes in Contract Control, specify end-user additional charges and any associated comments.

12 If End User Totals is Yes in Contract Control, view summary totals for this end user.

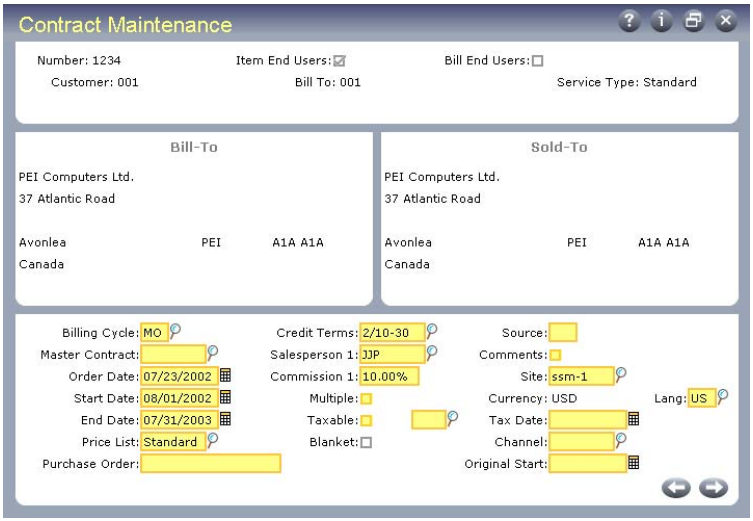
13 If Contract Additional Charges is Yes in Contract Control, specify contract-wide additional charges and any associated comments.

14 View contract totals and modify contract trailer information.

Use the following illustrations and field descriptions to understand the details of creating contracts for items with end users in Contract Maintenance (11.5.13.1).

This sequence of illustrations highlights only what is unique about creating a contract with Item End Users set to Yes. When the fields have the same effect as contracts for end users with items, refer to the previous field descriptions and discussions.

Fig. 8.20
Contract Maintenance (11.5.13.1)



Contract Header

See “Contract Header” on page 267.

Set Item End Users to Yes to create a contract for items with end users. Other fields in the header are used in the same way as they are in a contract for end users with items.

One exception is the Blanket field. In item/end-user sequence, all lines on the contract have blanket coverage; you cannot change this value for an end user.

Second Header Frame

See “Second Header Frame” on page 271.

This frame is identical to the frame displayed in end-user/item sequence, except that you cannot update the Visits field. PM schedules exist only at the item level when Item End Users is Yes.

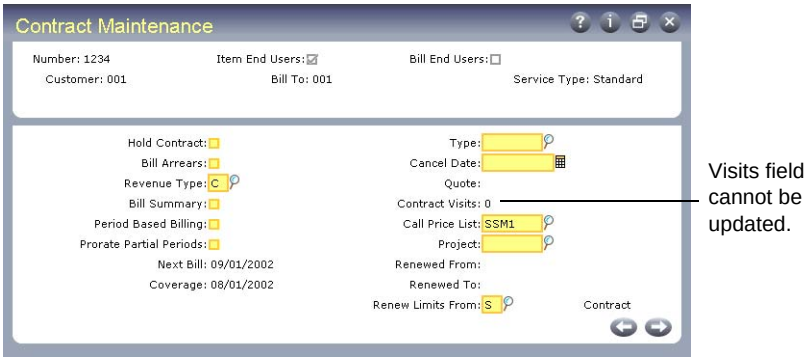


Fig. 8.21 Contract Maintenance, Second Header

Header Coverage Limits

This frame is exactly the same as the header coverage limit frame in end-user/item sequence.

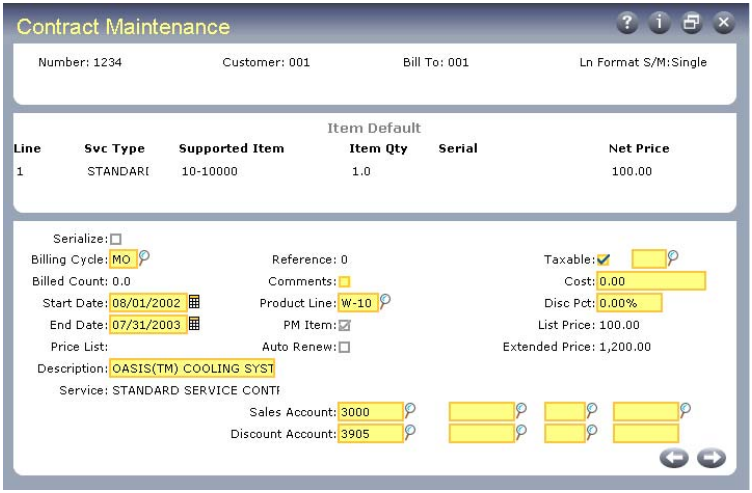
See “Header Coverage Limits” on page 276.

Item Default

The Item Default frame displays next. This frame looks similar to the item detail frame, but you only specify limited information here, such as the item number and other attributes of the item that default to the specific item instances owned by each end user.

If you specified a source for items earlier, the system creates default item lines for the items you selected.

Fig. 8.22
Item Default



In this frame, you cannot specify serial, serialize, reference, or PM item.

Item Default Coverage Limits

If Contract Limits is Yes in Contract Control, you are prompted to copy limits to the default item. If you previously copied limit detail into the contract header, you can copy default item limits from the header or the contract type.

See “Header Coverage Limits” on page 276.

This frame is exactly the same as the header coverage limit frame in end-user/item sequence.

Item End User Address Frame

After completing header limits, you specify an end user who owns specific instances of the previously defined default item.

Fig. 8.23
Item End User Address Frame

Item End User

Use this frame to modify defaults associated with the end user. In item/end-user sequence, you can modify only a few fields associated with the end user.

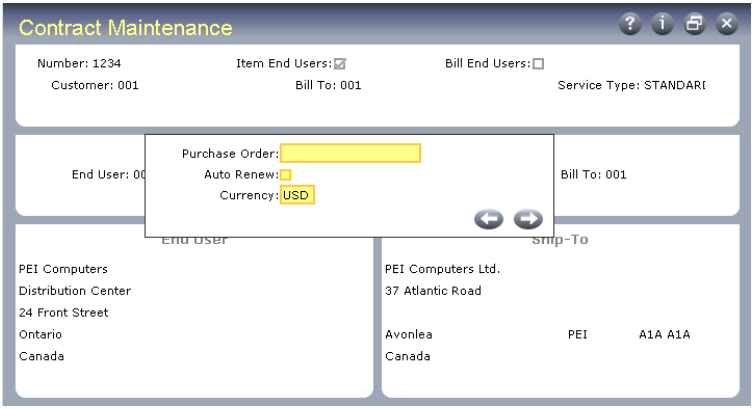


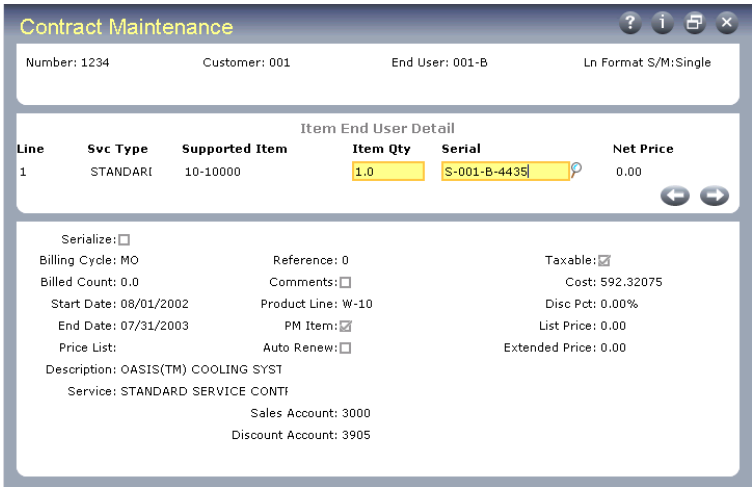
Fig. 8.24
Item End User

Default values for the other fields not displayed in this pop-up either do not apply (blanket end user) or are set in the default item record (billing cycle, start and end dates, project).

Item End User Detail

An end user can have multiple instances of the default item, each with a different service type. The line-item service type overrides the header service type. For example, specifying a different service type might bring in a different price list or change the level of coverage. If you change the service type, you are prompted to update the price from the new price list.

Fig. 8.25
Item End User Detail



See “Entering End User Item Details” on page 279

This frame is almost exactly the same as the item detail frame in end-user/item sequence. However, the Item field cannot be updated, since you are creating detail related to the default item you entered previously.

In this frame, you specify the values you could not specify in the default item frame: lot or serial numbers, reference numbers, and PM item. Serialize can be modified when you enter a quantity greater than 1 of lot or serial-number controlled items.

Preventive Maintenance Detail

See “Scheduling Visits for a Line Item” on page 338.

If PM Item is Yes, a preventive maintenance detail pop-up displays. The default number of visits is always 0 (zero), since the header Visits field cannot be modified in this sequence. You can create a line-item schedule by specifying a number of visits in the pop-up.

Contract Accounts Pop-Up

If Display Contract Accounts is Yes in Contract Control, a pop-up window displays the Sales and Sales Discount accounts and cost centers being used and lets you modify them.

Item Detail Coverage Limits

If Contract Limits is Yes in Contract Control, the system again prompts you to copy service limits when you finish entering a detailed item. If you respond Yes, your choices depend on how you responded to previous prompts:

- If default item limits exist, you can copy from the default item or the service type.
- If default item limits do not exist and header limits do, you can copy from the header or the service type.

If you set up limits for the detail item, amounts accumulate against these limits, not the default item or contract header.

The limits frame is the same as the one used for contract header limits.

See “Header Coverage Limits” on page 276.

PM Schedules

If PM Item is Yes for the line item and you entered a nonzero value in the line-item Visits field, the PM Schedule for Line: n frame displays the scheduled dates.

See Figure 10.5 on page 342.

Item End-User Iteration

After you add all instances of the default item for one end user, the Item End User frame redisplays so that you can associate another end user with this default item. If you have added all end users, press End to continue.

Item Default Iteration

The Item Default frame redisplays so you can add another default item to the contract. If you have added all default items, press End to continue.

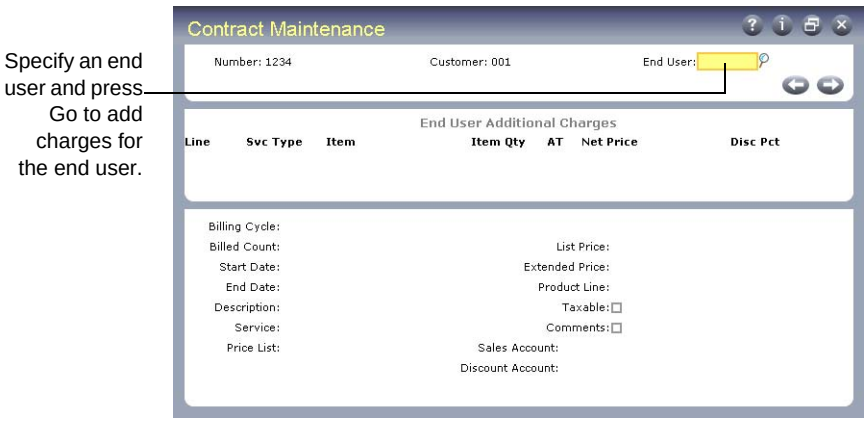
End User Additional Charges

See “Contract Additional Charges” on page 255.

If End User Additional Charges is Yes in Contract Control, you can associate additional charge items with each end user. These items are defined in Contract Additional Charges (11.5.7). Each charge is added as a separate line item with its own pricing information.

Adding additional charges in item/end-user sequence is similar to adding them in end-user/item sequence except that you must specify an end user before you can continue. After entering lines for one end user, you can specify a different end user and add more lines.

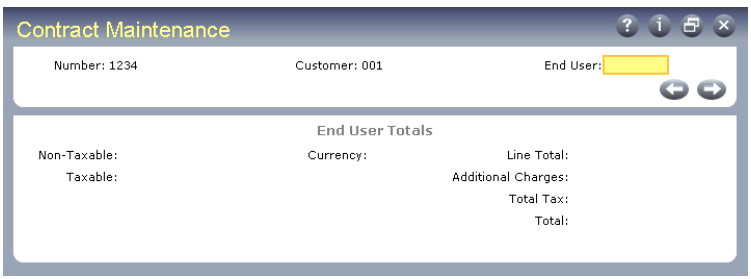
Fig. 8.26
End User Additional Charges in Item/End-User Sequence



End User Total

If End User Totals is Yes in Contract Control, the following frame displays. As with the End User Additional Charges frame, you must first specify an end user before the summary information displays.

Fig. 8.27
End User Total in Contract Maintenance



The fields in this frame are similar to those that display in the contract trailer, but apply to amounts for the current end user only.

See“End User Total” on page 287.

Contract Additional Charges

If Contract Additional Charges is Yes in Contract Control, you can associate additional charge items with the contract. This frame is the same as the one that displays in end-user/item sequence.

See “Contract Additional Charges” on page 287.

Contract Trailer

The contract trailer in item/end-user sequence is the same as the trailer in end-user/item sequence.

See “Contract Trailer” on page 288.

Copying Contracts

Rather than entering a contract manually in Contract Maintenance, you can create a contract by copying an existing one with Contract Copy to Contract (11.5.13.6).

Fig. 8.28 Contract Copy to Contract (11.5.13.6)

This function is similar to Renew Single Contract (11.5.13.8). To be copied, a contract does not have to be fully billed.

To copy a contract, specify its number in the header. Start Date defaults to the first of the month following the current end date. The system bases the end date on the existing contract's duration. You cannot set the start date earlier, since this would cause the items on the contract to be covered twice.

Service type defaults from the source contract but can be changed. You can specify a new number for the contract, or the system supplies the next number.

For details, see "Multicurrency and Contract Copy and Renewal" on page 253.

If the new contract should have a different currency, specify it in the Currency field and set Update Prices to Yes to calculate prices in the new currency.

The Renew Limits From field lets you copy limits from the source contract to the new contract, or look back at the service type and copy limits from it. This field defaults from the value specified for the source contract. If the limits on this contract have been heavily customized, you may want to preserve them. If you have set up effective dates on the contract type, you may want to look back at the type to apply the new limits based on the new contract's start date.

Use this option in conjunction with the Service Type field for full control over service limits. If you specify a new service type and indicate that limits should be copied from service type, the new limits are applied.

If prices or price lists have changed since you generated the previous contract, you can have the system update the prices. If you want to update prices, the system uses either the price list associated with the contract's service type (Contract Price List is No) or the one associated with the contract.

A contract or contract quote can have multiple lot and serial numbers associated with one line when you use the Serialize option. The Copy Serial Detail field determines if the system includes the lot and serial numbers on the new contract.

- When Yes, numbers are copied to the new contract.
- When No, the system creates a line without lot and serial numbers. In this case, update the new contract manually, since the system does not find coverage for lot and serial-controlled items if these numbers are not specified.

Renewing Contracts

Contracts always have start and end dates. To remain in effect, the contracts must be renewed. There are several ways to accomplish this:

1. Use Contract Maintenance to extend the end date.
2. Use Renew Single Contract (11.5.13.8) to renew a particular contract that is about to expire.
3. For contract lines with Auto Renew set to Yes, use Renewal Process/ Report (11.5.13.10) to renew lines for selected ranges of contracts and end users.
4. Copy the existing contract to a new contract with Contract Copy to Contract (11.5.13.6).

See “Copying Contracts” on page 299.

When you use either method 2 or 3, the system verifies that the contract has been fully billed before it can be renewed.

PO Required

If the customer or end users associated with a contract require a purchase order, the system carries over the existing purchase order numbers when contracts are renewed. If a new PO applies to the renewed contract, change it manually.

Renewal Numbers

Contracts cannot be renewed to the same number. The system retrieves the next available number from Contract Control, except in cases where a new number can be supplied.

There are several good business reasons for contracts to be renewed with new numbers.

- Renewing to the same number reinitializes the existing contract. This could easily leave a lapse in coverage at the end of the year between the time the contract was renewed and the beginning of the next year.
- Renewing to the same number also removes historical references to previous terms and agreements, which may be important in answering questions about contractual obligations.

- Finally, renewing to the same number invalidates any calls that may currently reference the contract. A call taken on December 31 should be serviced under the old terms and conditions—not the ones in effect on January 1.

Renewal and Limits

See “Renewal and Contract Limits” on page 244 for more details.

If Contract Limits is Yes in Contract Control and contract coverage levels and limits are part of the contract, the contract renewal process accommodates the coverage records in two ways:

- You can copy limits for the new contract from the old contract with new effective dates.
- The system can retrieve limits from the service type and copy them into the new contract.

Which approach the system takes depends on Renew Limits From on the contract. Set the default for this field in Contract Control. If you renew contracts one at a time, you can modify this field. When you do batch renewal, the system uses the value associated with each contract being renewed.

If you have extensively customized limits in a contract, you probably want to copy them to the new contract. You can also set up limits on the service type using effective dates and then have the system apply the coverage records effective for the new contract duration by referencing the service type.

Renewal and PM Schedules

When you renew a contract with a PM schedule, the system calculates a schedule for the next coverage period, just as it did when the contract was created. If Create PM Calls is Yes in Contract Control, the system creates the first call on the schedule. If you are renewing a large number of contracts, a corresponding large number of calls is added to the system.

See “Creating PM Calls” on page 341.

Control the creation of calls by setting Create PM Calls to No and using the Call Generator (11.1.8) to create scheduled calls for specified time ranges.

Service Types and Prices

When you copy or renew individual contracts, you can specify a new service type to be used. If you do, the system loads the new value into the header of the new contract and into any lines that matched the header. If the service type on a line did not match the contract header, it is not changed. You can also copy limits from the new service type by specifying S in Renew Limits From. New lines added to the new contract will use the new service type by default.

You can update pricing during renewal. Use this option by itself or in combination with a changed service type. The price list for recalculating prices can be on the service type or on the source contract. The system uses the start date of the new contract when it searches for effective prices.

Renew Single Contract

Use Renew Single Contract (11.5.13.8) to renew one fully billed contract.

Fig. 8.29 Renew Single Contract (11.5.13.8)

To renew a contract, specify its number in the header. The new start date defaults to the first of the month following the current end date. The system bases the End Date value on the existing contract's duration. Service Type also defaults from the existing contract but can be changed.

Renew the contract with a new number. If you leave New Number blank, the system uses the next available number. If prices or price lists have changed since you generated the previous contract, the system can update prices. Renew Limits From defaults from the source contract, but you can change it. You can also copy serial detail associated with a contract line. This is typically set to Yes during renewal.

For details, see "Multicurrency and Contract Copy and Renewal" on page 253.

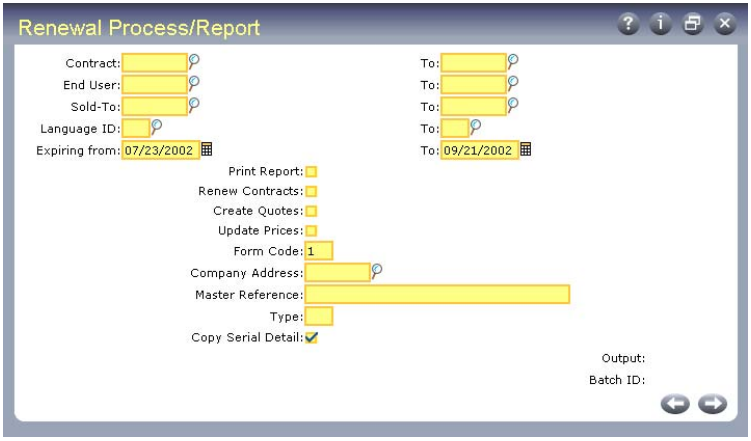
If the new contract should have a different currency, specify it in the Currency field and set Update Prices to Yes to calculate prices in the new currency.

Renewing Contracts Automatically

Use Renewal Process/Report (11.5.13.10) to review contracts near expiration and optionally generate service quotes or renew contracts at old or new prices. To be included in the renewal process, a contract line must meet the following conditions:

- It must be fully invoiced.
- Auto Renew must be set to Yes.

Fig. 8.30
Renewal Process/ Report (11.5.13.10)



Tip
Define the default for Auto Renew in End User Address Maintenance (11.9.1).

Based on date ranges or other selection criteria, you can perform multiple functions with this program:

- Print reports showing contract lines that will expire within a range of dates.

- Automatically create quotes based on existing contracts, optionally updating prices. You can then mail the printed quotes to the customer or end user for approval and release approved quotes to contract. You can include a renewal letter by setting one up in master comments and specifying the master reference when quotes are generated.

  Quotes are created with an Action Status of A. This indicates that the quote was created through automatic renewal and prevents it from being released to a contract before review. To release the quote to a contract, remove the A from the Action Status field.
- Automatically renew contract lines with Auto Renew set to Yes, optionally updating prices.

Figure 8.31 illustrates two methods for renewing contracts, one using quotes and one going directly from contract to contract.

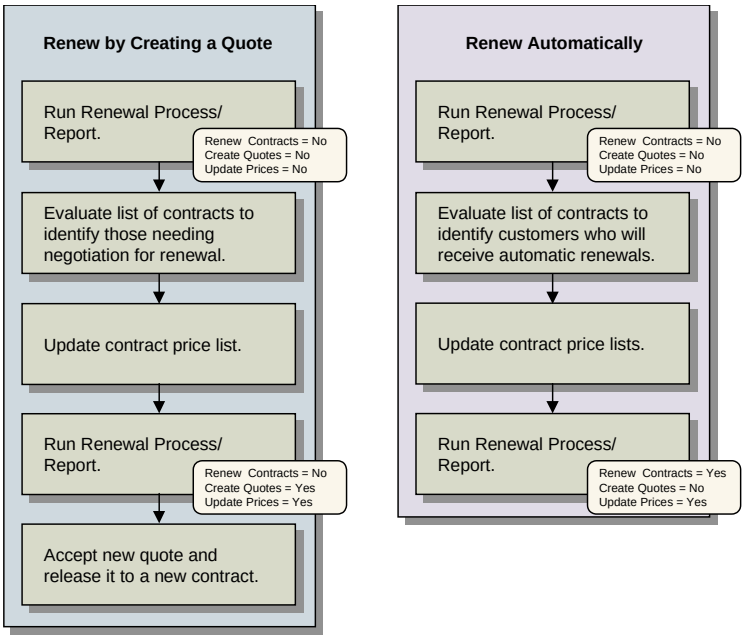

Renew by Creating a Quote
Run Renewal Process/ Report.
Renew Contracts = No
Create Quotes = No
Update Prices = No
Evaluate list of contracts to identify those needing negotiation for renewal.
Update contract price list.
Run Renewal Process/ Report.
Renew Contracts = No
Create Quotes = Yes
Update Prices = Yes
Accept new quote and release it to a new contract.
Renew Automatically
Run Renewal Process/ Report.
Renew Contracts = No
Create Quotes = No
Update Prices = No
Evaluate list of contracts to identify customers who will receive automatic renewals.
Update contract price lists.
Run Renewal Process/ Report.
Renew Contracts = Yes
Create Quotes = No
Update Prices = Yes

Fig. 8.31 Renewing Contracts

Tip
To ensure consistent results, execute the report function first and review the output before attempting to create quotes or renew contracts.

Renewal Process/Report resets the start and end dates on the contract, so the start date is the day after the expiration date of the original contract. The end date defaults from the service type's duration. The billing process continues as usual, using the new dates. Contracts are always renewed with a new number. The system retrieves the next available number from Contract Control.

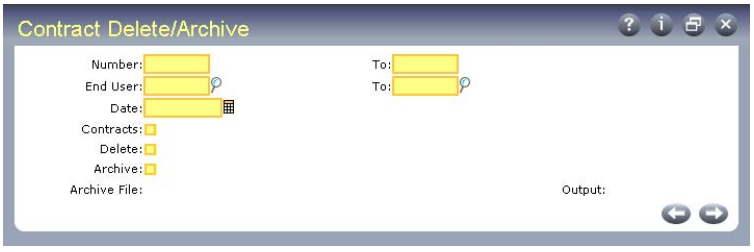
You can run this function multiple times for the same contract for different ranges of end users. However, each time you do this a new contract is created. If you want the renewed contract to look like the old one, you must include all end users in the range when you process renewals or leave the end-user range blank.

Contract Delete/Archive

Use Contract Delete/Archive (11.5.13.23) to delete and archive contract and contract quote records when online history is no longer needed. Before processing a record, the system checks the following:

- Contracts must be fully billed (coverage date is the same or exceeds the end date).
- All revenue must be recognized for contracts with deferred and accrued revenue types.

Fig. 8.32
Contract Delete/ Archive (11.5.13.23)



If you enter a range of end users, only data for end users within that range is deleted or archived.

Important Be careful when using this option. Archived data for end users probably cannot be reloaded into the system. By running this function for end users, you are deleting parts of contracts. If the contract changes, you cannot add the lines back.

When contracts are deleted, related data is also removed from the system, including billing detail records, deferred/accrued revenue details, preventive maintenance schedules, and coverage limit records.

Contract deferred/accrued revenue records can be archived separately with Contract Revenue Delete/Archive (11.5.18.23).

See “Deleting Revenue Records” on page 321.

Contract Quotes

You can create contract quotes as a preliminary step in creating a contract. Contract quotes are the same as contracts, except they are not yet effective. Create and maintain quotes in Contract Quote Maintenance (11.5.1.1), which functions exactly like Contract Maintenance with the exception of one additional prompt.

A pop-up window displays the Release to Contract field. If you specify No to this prompt, the quote cannot be released until you change this field in Contract Quote Maintenance.

Just like contracts, you can create quotes in multiple ways:

- Enter them manually in Contract Quote Maintenance (11.5.1.1).
- Copy them from an existing quote with Contract Quote Copy from Quote (11.5.1.6).
- Copy them from an existing contract with Contract Quote Copy from Contract (11.5.1.7).
- Create them as part of renewing expired contracts with Renewal Process/Report (11.5.13.10).

When a quote is finalized, you can release it as an active service contract. Until released, it is only a working document and has no financial impact.

Releasing the Quote

After you create a quote, you can release it to a contract using Contract Quote Release to Contract (11.5.1.5). To do this, Release to Contract must be Yes in the quote header.

You can release all lines on a quote to a contract, or release lines by range of end user. However, unlike sales quotes, you cannot release a line more than once. After release, the quote remains in the system until deleted.

When a quote is released:

- The system updates the quote with the contract number created.
- The new contract references the quote number.
- If the quote includes one or more preventive maintenance (PM) schedules for end users or lines, they are copied to the contract. If Create PM Calls is Yes in Contract Control, the system creates calls for the first scheduled PM visits.

A number of conditions cause errors during the release process:

- If any quote line overlaps an existing contract, the quote cannot be released. You need to fix the erroneous line before releasing the quote.
- A quote cannot be released if it has a non-blank Action Status.
- If Credit Hold Option is 2 in Service Management Control and the customer on the quote is on credit hold, an error displays.
- If you defined the customer on the quote header or any end user on the quote as requiring a purchase order, one must be specified before the quote can be released.
- If the currency on the quote line is invalid or a valid exchange rate does not exist, it cannot be released.

Chapter 9

Contract Billing

This chapter discusses contract billing issues, including the options for managing billing, managing deferred and accrued revenue, and the procedure for releasing a contract billing to invoice.

Managing Contract Billing **310**

Managing Deferred and Accrued Revenue **317**

Releasing Contract Invoices **322**

Reprinting an Invoice **325**

Correcting a Billing **326**

Reviewing Contract Financial Data **330**

Managing Contract Billing

See Chapter 23, “Control Programs,” for complete information on control program settings.

Like most other service functions, contract billing can be approached in more than one way. A number of settings in Contract Control affect contract billing. You can tailor these settings to the needs of your business organization. Most of these settings set default values that can be modified on individual contracts as needed.

How you bill for service depends on how you have designed your service contracts. Here are some of the questions to consider:

- How often do you need to bill your customers for service contracts? Do you bill quarterly? Monthly? The answer depends largely on the prices of your contracts. If a one-year contract costs $250, is it worth breaking up the total into smaller monthly payments? What if the contract costs $24,000 a year? Are your customers willing to pay that amount in a single payment?
- Do you want to bill in advance of service or in arrears? The trend in aftermarket sales support is to pay in advance of service. This is true because companies typically like to receive revenue before committing to service. Often the sale of the service contract coincides with the sale of a product. However, customer relationships may dictate another approach where the bill is issued at the completion of the billing cycle, rather than at the beginning.
- Who typically receives the invoice for a contract? In some organizations, a central office handles billing. In others, each end user is responsible for paying coverage charges for the items they own and use.
- What kind of information should appear on the contract invoice? Some organizations prefer detailed information. For others, a summary statement is sufficient.

Use fields in Contract Control (11.5.24) to implement the decisions you make regarding these kinds of questions.

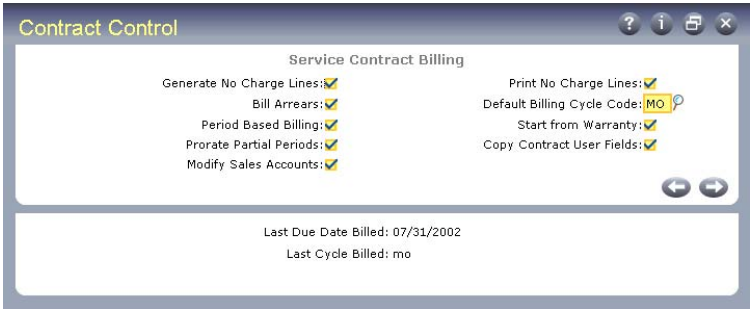


Fig. 9.1
Service Contract Billing Frame

Billing Cycles

You bill some contracts monthly, some quarterly, and some annually. To identify different billing cycles, create and maintain codes in Billing Cycle Code Maintenance (11.5.18.1).

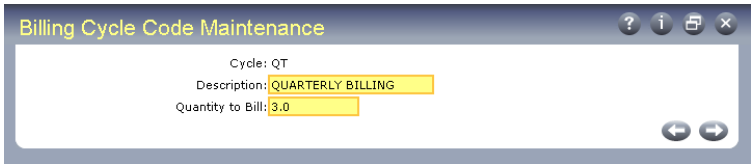


Fig. 9.2
Billing Cycle Code Maintenance (11.5.18.1)

The Quantity to Bill value represents the number of months in the billing cycle. When a contract is released to invoice with this billing cycle, the system calculates the invoice amount by multiplying the unit price by the number of units covered, and then multiplying this amount by the number of months in this billing cycle (Quantity to Bill).

Example For a quarterly billing cycle code, set Quantity to Bill to 3, billing three months of service each quarter.

Always enter a whole number for the quantity to bill, since a contract cannot be billed more than once in a month.

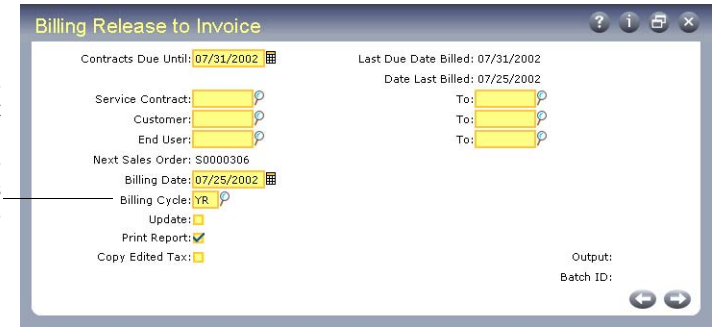
Specify a default billing cycle in Contract Control. This value supplies a default for the Billing Cycle field on the contract header when contracts are created. Billing cycle can be modified at multiple levels of a contract: contract header, default end user and items, and item details.

You can accept the default or specify a different billing cycle code at various levels below the contract header. However, you cannot specify a cycle that indicates less frequent billing than the cycle specified on the header. For example, the header billing cycle is annual. You cannot specify a billing cycle of every two years for a contract line.

You can delete a billing cycle code only if it is not currently referenced by any contracts or quotes.

You can use the billing cycle as a selection criterion in Billing Release to Invoice (11.5.18.13), illustrated in Figure 9.3. However, it is best to bill all cycles together. Enter a date in the Contracts Due Until field. Select a date greater than or equal to the date to be billed.

Fig. 9.3
Selecting a Billing Cycle in 11.5.18.13



Period Based Billing

When this field is No, the system creates contract invoices for periods—determined by the billing cycle—that begin with the contract start date. With this setting, the system bills a year-long contract with a start date of January 15 and a monthly billing cycle on January 15, February 15, March 15, and so on. This example assumes Bill in Arrears is No.

If Period Based Billing is No, the system takes into account the length of the month when the contract start date is at or near the end of a month. For example, the system bills a contract that started on January 31 on January 31, February 28 (except leap years), March 31, and April 30. A contract starting on April 30 would be billed on April 30 and May 31, not May 30, since the system knows that April 30 is the last day of the month for April, corresponding to May 31 in May.

When Period Based Billing is Yes, the system invoices on the first day of the appropriate calendar month (usually the next month), regardless of the actual start date of the contract. In the previous example, invoicing occurs on February 1, March 1, and so on.

Prorating Partial Periods

Prorate Partial Periods determines how the system handles partial periods that do not fit into a monthly cycle. In the previous example, if this field is Yes, the system generates a separate invoice for the period of Jan 15 through January 31. From that point on, invoicing is synchronized with the first of the month: The system creates a prorated invoice again at the end of the year for the period January 1 through January 14.

If Prorate Partial Periods is No and Period Based Billing is Yes, the covered days that do not fit cleanly within a month are essentially given away. If you want to ensure complete invoicing, set Prorate Partial Periods to Yes.

Partial billing periods can result when Period Based Billing is Yes, but they may also occur if contract start and end dates do not follow monthly cycles. For example, if Period Based Billing is No and you have a contract from January 22 to April 5, the system bills for two full months from January 22 to February 21, and February 22 to March 21. This leaves 15 days of coverage.

The price for coverage is in terms of monthly units. To determine the price for a number of days less than a month, the system uses the number of days in the month of the last coverage day. In the previous example, the last day of coverage is April 5. April has 30 days. So the prorated price is 15 divided by 30, resulting in 0.5 months. If the last day of coverage was May 5, the calculation would use 31 days and have a slightly different result.

The header start and end date determine the billing periods for a contract. The system then attempts to fit each line within the periods defined by the header. If a contract line begins or ends on a different day than the contract header, this can result in partial periods for the line that are then either dropped or prorated, depending on the control program settings.

For example, a contract has header dates of January 15 to March 14 and a monthly billing cycle. Period Based Billing and Bill Arrears are both No. The billing periods for the contract would be January 15 to February 14 and February 15 to March 14. The system bases line-item billing on the same periods.

The first line item on the contract has start and end dates of February 1 to February 28. The system bills this as two partial periods using the header billing periods. The system bills line coverage for February 1 to February 14 in the first period and coverage for February 15 to February 28 in the second period. If Prorate Partial Periods is No, this line would generate a 0 invoice amount during both periods, even though it appears to be for a month.

Billing in Arrears

Contracts are billed in arrears on the day following the end of each billing cycle. For example, if you have a contract on a monthly cycle that is billed in arrears and the first period is January 1 to January 31, the invoice is generated on February 1, the first day of the next monthly billing cycle.

Set a default value for bill in arrears in Contract Control. The system uses this setting for each new contract. You can change it.

The setting of Bill Arrears affects which revenue type can be used with a contract:

See “Managing Deferred and Accrued Revenue” on page 317.

- When Bill Arrears is Yes, you can choose cash basis or accrued.
- When Bill Arrears is No, you can choose cash basis or deferred.

Billing Customers or End Users

Tip
The invoice for contract-wide additional charges is always sent to the header billing address, regardless of the value of Bill End Users.

You can use the Bill End Users field in Contract Control to indicate who normally receives invoices generated for contracts by Billing Release to Invoice:

No: Only one billing address, specified in the contract header, is associated with the contract. Billing Release to Invoice generates all contract invoices to this address.

Yes: Multiple billing addresses can be associated with the contract, one for each contract end user. At least one invoice is generated in Billing Release to Invoice for the bill-to address associated with each end user defined on the contract.

Important When Bill End Users is Yes, you must ensure that your end users are also defined in Customer Maintenance.

The control program field sets the default for the same field in the header of new contract quotes and contracts.

Summarized or Detail Billing

Set a default value for Bill Summary in Contract Control. The value for each contract determines the format of invoices generated by Billing Release to Invoice.

When Bill Summary is Yes for a contract, the details that are not printed on an invoice are stored in the database. You can view these details using Billing Detail Report.

The effect of summarized billing depends on the settings of Bill End Users and Item End Users. When you are billing the contract customer, Billing Release to Invoice generates one invoice to the bill-to address on the contract header. When you are billing the contract end users, Billing Release to Invoice generates one invoice for each end-user bill-to address.

Note The exceptions to generating single invoices are noted in the following section.

Table 9.1 illustrates the effects of various control settings when you are billing the contract customer (Bill End Users is No).

Table 9.1 Interaction of Customer Invoice Options

Item End Users	Bill Summary	Invoice Content
No	No	Detailed billing information for each end-user/item combination, sequenced by end user.
Yes	No	Detailed billing information for each item/ end-user combination, sequenced by item number.

Item End Users	Bill Summary	Invoice Content
No	Yes	Summary of one line per end user; the summary amount includes all charges for all items linked to the end user.
Yes	Yes	Summary of one line per item on the contract; the summary amount includes all charges for all end users linked to that item.

When Bill End Users is Yes, Item End Users has no affect on the invoice. This is illustrated in Table 9.2.

Table 9.2
Interaction of End-User Invoice Options

Bill Summary	Invoice Content
No	One line per item, sequenced by item line number
Yes	One line per invoice, for total of all items for the end user

Constraints on Summarized Billing

Summarized billing is not always possible, even when Bill Summary is Yes. If any of the following differ for billable lines, separate invoices are always generated:

- If billing end users, the detail bill-to address
- Language
- Currency
- Exchange rate

Note The system limits invoices to 999 lines. If the setting of Bill Summary would result in more than 999 lines on an invoice, Billing Release to Invoice creates separate invoices as needed.

In addition, details within an invoice can be summarized only when they share the following characteristics:

- Service type
- Contract line type: either a contract detail or additional charge
- Tax attributes, including taxable, tax environment, tax class, tax usage, tax included, PST
- Sales account, sub-account, cost center
- Project

Service Sales Order Prefix

When you release a contract to invoicing, the system creates a sales order you can print and post using the Sales Orders/Invoices module. It is usually best to set up a prefix and a different number range for contract sales orders. This helps distinguish them from standard sales orders.

Do this by specifying values for Service SO Prefix and Next Service Sales Order in Contract Control (11.5.24).

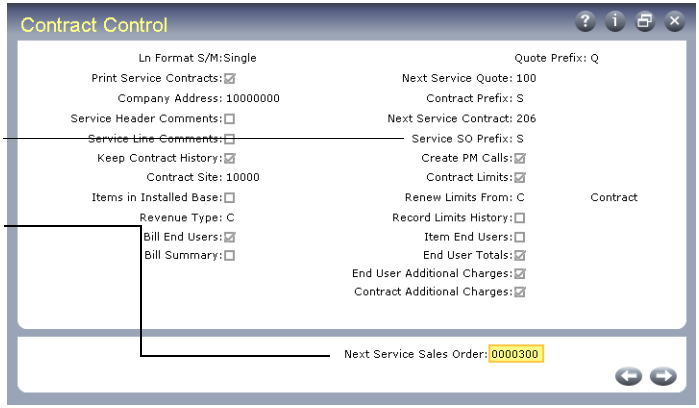


Fig. 9.4
Setting up a Service SO Number in Contract Control

In this example, the Service SO prefix is S, and the next service sales order number is 0002145.

Managing Deferred and Accrued Revenue

When you create a contract, you indicate what type of revenue recognition you want to use. The default value for new contracts is set in the Revenue Type field in Contract Control. You can choose one of three ways of recognizing revenue:

Cash Basis: In cash-basis accounting, revenue is recorded in the period it is actually received.

Accrued: In accrual basis accounting, revenue is recorded in an Accrued Revenue account in the period in which it is earned, even though cash is not received in that period. To use this revenue type, Bill Arrears must be Yes. When you invoice at the end of service coverage, this lets you post accrued amounts during the duration of the contract.

Deferred: In deferred accounting, collected revenue is held in a deferred account and is posted periodically over the contract duration. To use this revenue type, Bill Arrears must be No. You invoice at the beginning of the contract coverage and perform your normal invoicing procedure. Total revenue is posted to a Deferred Revenue account and moved periodically over the duration of the contract.

Note Only general revenue is accrued or deferred; discount, taxes, and additional charges are not.

Revenue Accounts

If you are using deferred or accrued revenue types, set up Deferred and Accrued Revenue accounts at the system level, by product line, or for combinations of product line, channel, site, and customer type.

To find deferred and accrued accounts, the system searches first for alternate sales accounts set up in Sales Account Maintenance (1.2.17) using:

- The product line of the service type in effect
- The channel specified on the contract header
- The contract site
- The customer type

If these do not exist, it uses accounts set up in Product Line Maintenance (1.2.1). If these do not exist, it uses accounts defined in System/Account Control (36.1).

Note The setting of Use Item Product Line in Service Management Control does not affect the search for Deferred and Accrued Revenue accounts. These accounts apply to the contract as a whole, not individual lines. Therefore, the product line associated with the service type is always used in the search for accounts.

Recognizing Revenue

Run Revenue Recognition (11.5.18.21) each month for the system to recognize accrued and deferred revenues for billing cycles other than monthly.

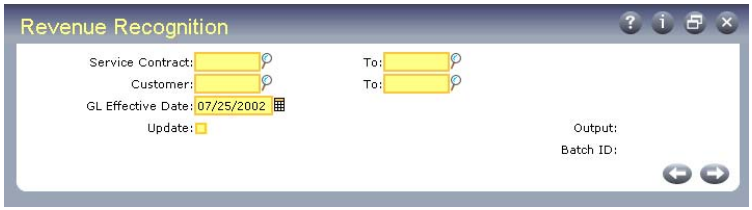


Fig. 9.5 Revenue Recognition (11.5.18.21)

Select revenue to be updated by range of contract and customer codes and indicate when the GL transactions should be effective. Set Update to No to generate a report of revenue amounts that the system needs to update without making any changes.

Important Do not modify the details that have been accrued on a contract after running Revenue Recognition. For example, you can add new contract lines, but do not change the billing cycle or start date of lines that have been accrued.

Deferred Revenue

When the revenue type of a contract is deferred, release the contract for billing to generate a pending invoice. Print and post the invoice. This creates the following transactions:

Debits Accounts Receivable

Debits Sales Discount

Credits Sales (for the current month)

Credits Taxes, Trailer Charges

Credits Deferred Revenue (for remaining billed months)

Posting the invoice also creates revenue records that can be displayed with Deferred/Accrued Revenue Report (11.5.18.22). The report shows the invoiced, recognized, and deferred amounts, and the number of periods left for recognition.

Running Revenue Recognition then creates the following transactions:

Debits Deferred Revenue

Credits Sales

The number of months to bill on the contract must be greater than one. For deferred revenue, running Revenue Recognition is not needed for contracts and contract lines with monthly billing cycles, since monthly billing and accounting functions update revenue totals. However, when the billing cycle is less frequent than monthly, monthly accounting totals do not include unrecognized revenues held in deferred accounts.

Accrued Revenue

When the revenue type of a contract is accrued, you run Revenue Recognition before releasing the contract to an invoice. This creates the following GL transactions:

Credits Sales (for the monthly billing)

Debits Accrued Revenue (for the monthly billing)

Run Revenue Recognition every month until the billing cycle is complete. Then release the contract for billing to generate a pending invoice. Print and post the invoice. This creates the following transactions:

Debits Accounts Receivable (for all billed months)

Credits Accrued Revenue (for all billed months)

For accrued revenue, running Revenue Recognition creates revenue records that can be displayed with Deferred/Accrued Revenue Report. The report shows the total amount to be accrued, the amount already accrued, the amount remaining to be accrued, and the number of periods left for accrual.

Viewing Deferred/Accrued Revenue Records

Run Deferred/Accrued Revenue Report (11.5.18.22) to display records created and updated by Revenue Recognition.

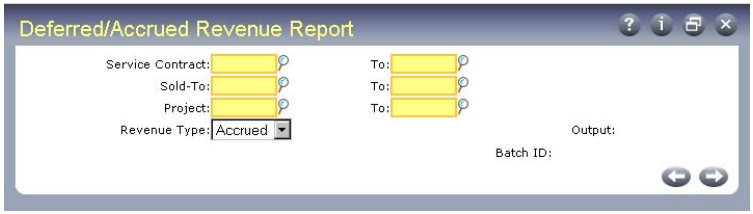


Fig. 9.6 Deferred/Accrued Revenue Report (11.5.18.22)

You can select records by range of contract number, customer code, and project. You can display either accrued or deferred records on one report; you cannot display them together.

```
fssdefrp.p     11.5.18.22 Deferred/Accrued Revenue Report      Date: 02/19/02
Page: 1                          MOW Industries                Time: 12:09:48
                            Accrued Revenue Report


Service Contract: 640      Sold-To: 101      Project:

                                                                 Remaining Periods
Item Description  Eff Date To be Accrued Accrued Revenue to be Accrued    Left
---- ------------ -------- ------------- --------------- ------------- -------
1000 Service Item 03/01/01        180.00           15.00         165.00   11.0

                          Totals 180.00          15.00        165.00
```

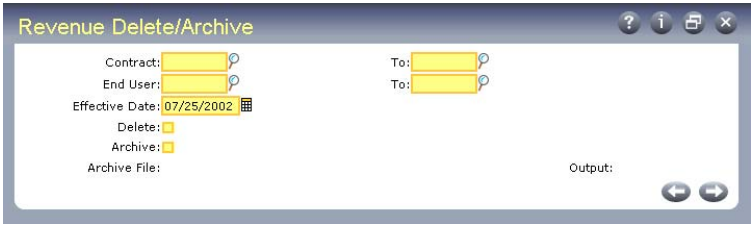
Fig. 9.7 Deferred/Accrued Revenue Sample Report

Deleting Revenue Records

Use Revenue Delete/Archive (11.5.18.23) to archive or delete deferred or accrued revenue records with zero amounts when online history is no longer needed. These records are needed only while open billing periods remain on the contract.

Note If you do not execute this program, revenue records are archived by Contract Delete/Archive (11.5.13.23) when their related contracts are processed.

Fig. 9.8
Revenue Delete/ Archive (11.5.18.23)



You can delete and archive revenue records by range of contract number or end-user address.

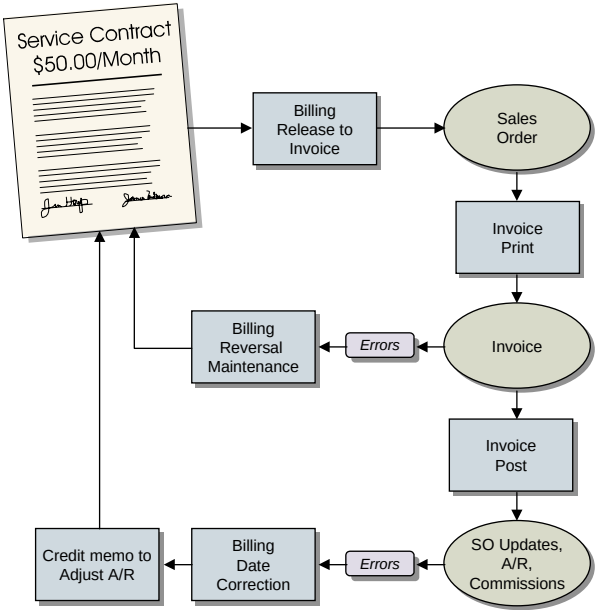
Releasing Contract Invoices

Use Billing Release to Invoice (11.5.18.13) to generate sales orders that serve as pending invoices for selected contracts with lines that are ready to bill. Print and post these pending invoices with functions on the Sales Orders/Invoices menu. Billing cycle codes control when a given contract generates a pending invoice.

See "Summarized or Detail Billing" on page 315.

The content of contract invoices is determined by the value of Bill Summary for the contract. The billing address is determined by the value of Bill End Users.

Fig. 9.9
Billing Cycle Flow



The system maintains a transaction history (ISS-SO) for contract billing. If Keep Contract History is Yes in Contract Control, ORD-SO transactions are also maintained.

To prevent billing problems, execute Billing Release to Invoice with Update set to No and Print Report set to Yes before you actually generate invoices. This creates a report listing contracts that would be selected, without updating them. When you have verified the contracts and billing, you can re-execute the function to generate the pending invoices.

The amount to invoice is based on the contract line price, quantity, and billing cycle. Prices for contract line items are stated as the price of service coverage for one installed unit for one month. To calculate the invoice amount, the system multiplies the line-item price by the number of units covered, and multiplies the result by the number of months in the specified billing cycle.

To indicate that a contract has been billed, Billing Release to Invoice updates the Coverage and Last Bill fields on the contract detail. When all contract lines have been fully billed for the contract header billing cycle, the contract header is updated to the next coverage date, and Last Bill and Next Bill are updated. You must run Billing Release to Invoice at least once during each contract billing cycle to update Coverage and Last Bill dates.

Billing Release to Invoice does not create any general ledger transactions. These are created by Invoice Post (7.13.4) and Revenue Recognition (11.5.18.21).

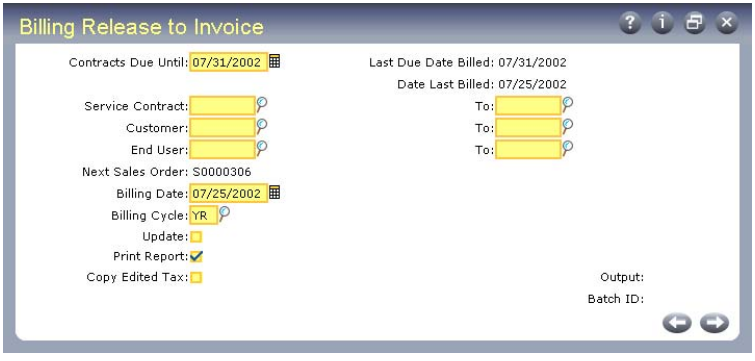


Fig. 9.10
Billing Release to Invoice (11.5.18.13)

Contracts Due Until. This date serves as the cut-off date used to determine the last day of the billing period.When Bill Arrears is No, lines are billed when the detail coverage start date or next bill date is the same as or earlier than the due date. When Bill Arrears is Yes, due date must be after the coverage end date

Last Due Date Billed and Date Last Billed. These fields are output only. Date Last Billed is the date the Billing Release to Invoice was last run. Last Due Date Billed is the date that was previously in the Contracts Due Until field. Whenever you run the release program, the system updates these dates.

Service Contract and To. Beginning and ending numbers determine the range of contracts to be billed.

Customer and To. Beginning and ending address codes determine a range of contracts to be billed.

End User and To. Beginning and ending address codes determine the range of contract lines to be billed

Tip
If you want to differentiate contract billing from other sales orders, set them up with a unique sales order prefix in the control program.

Next Sales Order. This output-only field indicates the first sales order number to be generated when Update is Yes. This number is found in Contract Control.

Billing Date. Enter the date the system should use as the order date for the pending invoices generated for selected contracts. The default is the system date.

Billing Cycle. Optionally, enter a billing cycle code to select contract lines for billing. Set up cycle codes in Billing Cycle Code Maintenance. Leave Billing Cycle blank to generate invoices for lines regardless of billing cycle.

Update. Set Update to No and Print Report to Yes to view a report of what will be billed without generating invoices.

Print Report. Enter Yes to print a report listing contract lines billed. Set Update to No and Print Report to Yes to generate a simulation of contract lines that would be billed based on the current input selections.

For each contract line billed, the report lists the contract number, pending invoice number associated with the line, service type, end user, line number, covered item, item quantity, duration being billed, currency, price, and extended price (quantity * duration * price).

Copy Edited Tax. Indicate how you want the system to manage tax amounts that were modified in Contract Maintenance: |

No: Taxes are recalculated based on current tax data, overwriting any manual changes previously entered.

Yes: The system copies the edited amounts to the pending invoice and uses them in the billing calculation.

When Update Tax Allowed is Yes in Tax Rate Maintenance (2.13.13.1) for a tax rate, you can modify the taxable base (amount subject to tax) and calculated tax amounts in Contract Maintenance. To change any other tax details, you must update the related fields on the order or modify the tax setup data.

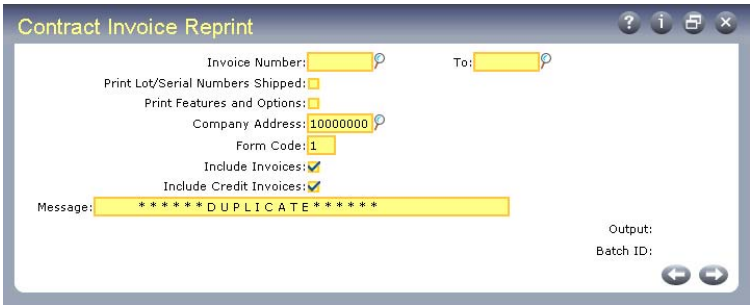
Reprinting an Invoice

Carefully manage the invoice print process since you do not want to send multiple copies of an invoice to a customer by mistake. Two fields on the invoice manage this process: Ready to Invoice and Invoiced. For a new invoice, Ready to Invoice is Yes and Invoiced is No.

The invoice print function examines these fields. Only invoices with Ready to Invoice set to Yes are printed. When the print function completes, the system updates these fields so Ready to Invoice is No and Invoiced is Yes.

Occasionally you need to reprint an invoice if, for example, it is destroyed or damaged in processing. To allow reprinting, you can edit these fields in Pending Invoice Maintenance (7.13.1) for standard sales order invoices. For contracts, use Contract Invoice Reprint (11.5.18.15) to reprint the invoice.

Fig. 9.11
Contract Invoice Reprint (11.5.18.15)



Select invoices to include by number range. You can reprint only invoices that have not been posted.

Correcting a Billing

You cannot use Pending Invoice Maintenance (7.13.1) to correct invoices generated through contract billing. This is because an incorrect invoice reflects an incorrect contract, and you must fix the contract in the SSM functions.

Service/Support Management offers two paths for correcting billing errors: one before contract invoices are posted to Accounts Receivable and one after.

- If you have not printed and posted the invoice, use Billing Reversal Maintenance (11.5.18.18) to delete it.
- If you have posted the invoice, create a manual credit and use Billing Date Correction (11.5.18.19).

Each time you bill a contract, the system updates the last bill, next bill, and coverage dates for the contract and each line item. If a contract has been billed in error, these dates must be reset. Billing Release to Invoice uses the next bill date to determine which contracts are eligible for billing. Reverse the next bill date value for an incorrectly billed contract so it can be re-released to invoicing.

Correcting an Unposted Invoice

If you have billed a contract in error and the invoice has not been posted, use Billing Reversal Maintenance to reverse the effects of the billing. This program removes mistakenly billed amounts from unposted contract invoices. If all billing amounts are reversed on an invoice, the invoice is removed from the system.

To correct an unposted invoice, follow these steps:

1. Use Billing Reversal Maintenance to delete the pending invoice and reset most billing dates. Billing Reversal Maintenance resets Coverage Date on both the contract header and detail and Next Bill Date on the header. It does not reset Last Bill Date since there was some billing activity.
2. Use Contract Maintenance to correct the elements of the contract that are in error, such as price, quantity, or billing cycle.
3. Use Billing Release to Invoice to re-release the contract to billing.

Figure 9.12 illustrates Billing Reversal Maintenance (11.5.18.18).

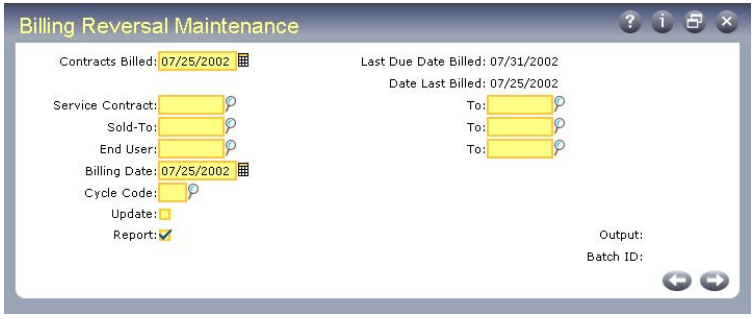


Fig. 9.12 Billing Reversal Maintenance (11.5.18.18)

Use this function to reverse a range of invoices selected by contract number, customer, end user, or billing cycle. The Contracts Billed field is the critical selection criterion; this must match the date you executed Billing Release to Invoice.

Execute this function first with Update set to No and Report set to Yes to review the potential impact of the reversal before you perform it.

Contracts Billed. Enter the date that the pending invoice amounts were generated. This is the date you executed Billing Release to Invoice (11.5.18.13).

Note This is not necessarily the same as the value specified in the Billing Date field in Billing Release to Invoice. You can change Billing Date from the default, which is the current system date.

The billing date becomes the order date of the pending invoice. The execution date becomes the ship date, displayed in reports such as Sales Order Tracking Inquiry (7.13.10).

Last Due Date Billed and Date Last Billed. These fields are output only. Date Last Billed is the date Billing Release to Invoice was last run. Last Due Date Billed is the date you previously entered in the Contracts Due Until field. Whenever you run the release program, the system updates these dates.

End User and To. Enter an end-user range for selecting contract billings to reverse. Leave blank to reverse billings for all end users that match the other criteria.

When an end-user range is specified, only detail information for matching end users is reversed. When summarized billing has been used, the reversed amounts are subtracted from the summarized totals.

Billing Cycle. Optionally enter a billing cycle for selecting pending invoices to reverse. If you specify a Billing Cycle, Billing Reversal Maintenance selects invoices only for this billing cycle code. If Billing Cycle is blank, the system processes all billing cycle codes.

Billing Date. The default is the system date. The system uses Billing Date as the effective date for transaction history. No selection is based on this date.

Correcting a Posted Invoice

If you billed a contract in error and have posted the invoice, you can use Billing Date Correction (11.5.18.19) to reset the billing dates on the contract header and contract line items.

Important The financial impacts of service functions are managed outside the SSM module. You must correct the billing itself by issuing a credit invoice or memo to negate the incorrect invoice amount.

Billing Date Correction works on one contract at a time. You must manually correct each contract posted incorrectly. To prevent lengthy corrections, establish procedures and verify contract invoices *before* you post them. Do this by executing the release function with Update set to No and Print Report set to Yes before creating the service sales orders.

To correct a posted invoice, follow these steps:

1. Create a manual credit invoice using Pending Invoice Maintenance (7.13.1). Then use Invoice Print (7.13.3) and Invoice Post (7.13.4) to credit the mistakenly billed amount.
2. Use Billing Date Correction to reset billing dates that were updated by Billing Release to Invoice. You must reset the dates on each affected contract line.
3. Use Contract Maintenance to make the necessary changes to the contract data, such as changes to price or quantity.
4. Use Billing Release to Invoice to re-release the contract to billing.

Figure 9.13 illustrates Billing Date Correction (11.5.18.19).

Fig. 9.13 Billing Date Correction (11.5.18.19)

Once you select a contract to modify, the system fills in the other fields with current data from the contract record. You can modify billing dates for the header, line items, and additional charges on this contract. Lines and additional charges display in additional frames.

Note The contract start and end dates can only be changed in Contract Maintenance.

Reviewing Contract Financial Data

Use the following reports to view financial information about contracts:

See “Viewing Deferred/ Accrued Revenue Records” on page 321.

- Use Deferred/Accrued Revenue Report (11.5.18.22) to view records created and updated by Revenue Recognition (11.5.18.21).
- Use Contract Cash Flow Report (11.5.13.21.1) to see the incoming cash to expect from contract billings.
- Use Contract Deferred Income Report (11.5.13.21.2) to determine for a base date the deferred or accrued income amount for any invoiced contracts with Revenue Type set to C (cash basis). If Revenue Type is A (accrued) or D (deferred), this report is not needed.

Contract Cash Flow

Contract Cash Flow Report enables you to see the incoming cash that can be expected from contract billings over a specified period. A heading line for each customer reported displays, with a line for each end user on the contract. Totals for each customer and for all customers display at the bottom of the report.

Figure 9.14 illustrates Contract Cash Flow Report.

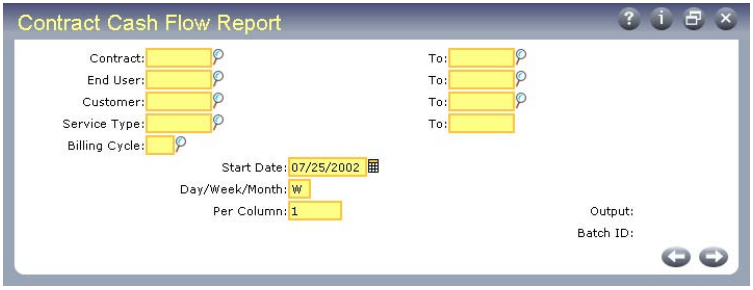


Fig. 9.14
Contract Cash Flow Report (11.5.13.21.1)

Select contracts to include by range of contract number, end user, customer, service type, and billing cycle code. The value for Start Date represents the beginning date in the first of six dated columns. The report is sorted in contract number sequence.

The level of detail of the output is based on the choice for Day/Week/Month. The Per Column field lets you specify how many of the grouping choices (D/W/M) should appear in each of the six dated columns.

The report displays one line per end user on each selected contract, with a line for contract totals. The display includes columns labeled Prior and Future. These represent the amount of cash flow for contract periods prior to the start date and for the balance of the contract in future periods. All amounts are expressed in base currency.

Contract Deferred Income Report

Contract Deferred Income Report (11.5.13.21.2) provides information about deferred and accrued income for invoiced contracts when you are not using Revenue Recognition. This usually does not apply to monthly contracts; it is more significant for quarterly and annual contracts billed in advance.

This report is useful if you have contracts with a cash basis revenue type that are not billed in arrears. When the payment for the entire period is received in advance, only a small portion can be recorded as income. The balance must be recorded, via a manual journal entry, into a liability account. Since you still owe the coverage for the future, you cannot declare it as actual income.

The deferred income report enables the accountant to take a periodic look at contracts to determine how much revenue they must accrue, and how much they can record, via a journal entry, as actual income.

See “Managing Deferred and Accrued Revenue” on page 317.

To handle deferred revenue automatically, set up contracts with a revenue type of deferred. Then use Revenue Recognition to create the appropriate GL transactions on a regular basis.

Figure 9.15 illustrates Contract Deferred Income Report (11.5.13.21.2).

Fig. 9.15 Contract Deferred Income Report (11.5.13.21.2)

Select contracts for reporting by range of contract number, end user, customer, service type, and billing cycle. Base Date defaults to the system date. It is used to determine the number of days of contract coverage that have already been provided. Figure 9.16 illustrates a sample report.

The report displays one line for each contract line and a line for the contract total. All amounts display in base currency.

Fig. 9.16 Sample Deferred Income Report

```
fssarp07.p a          11.5.13.21.2 Contract Deferred Income Report      07/01/02

Base Date: 07/01/02

Contract End User Line Item   Curr Cyc Begin    End      Billed  Realized Deferre
-------- -------- ---- -----  ---- --- -------- -------- ------- -------- -------
110      00000001 1    44-100 usd  YR  05/01/02 04/30/03 1476    250      1226

                                        Contract Total:  1476    250      1226

                                          Report Total:  1476    250      1226
```

Contract 110 has one item, for a monthly amount of $123.00. The total billed for this contract is $1476.00, 12 months in advance. This is indicated by the YR billing cycle code—Cyc column on the report.

The contract begins coverage on 05/01/02 (Begin) and ends coverage on 04/30/00 (End). Using 07/01/02 as its base date, the Start Date specified when the report was run, the report program performs the calculations listed in Table 9.3.

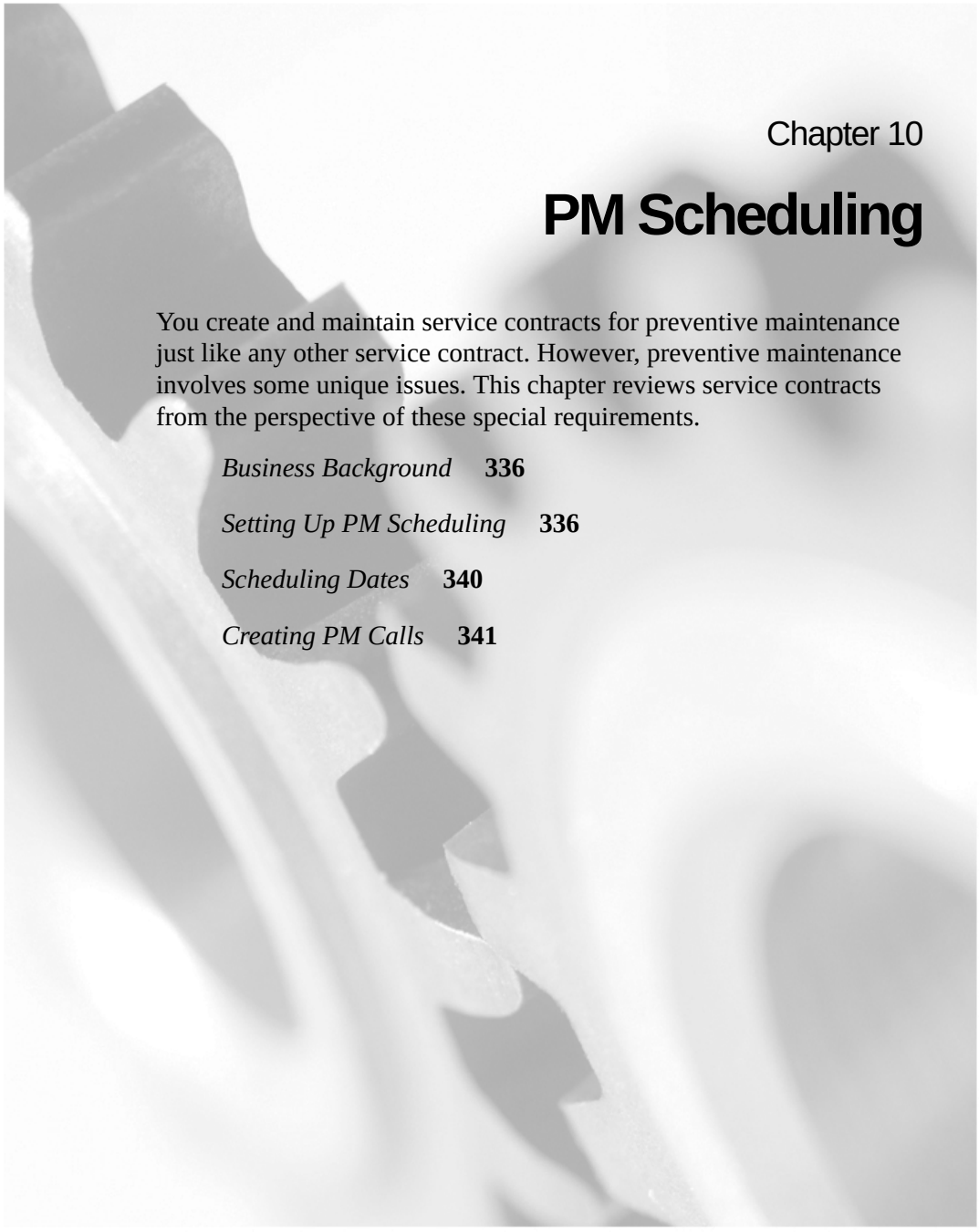
Table 9.3 Calculating Deferred Income

Calculated Amount	Results
Contract Total Amount =	Billed
Billed / 365 days =	Daily Amount
Covered Days =	Base Date - Begin Date
Realized =	Covered Days * Daily Amount
Deferred =	Billed – Realized

Using the actual values from the sample report, Table 9.4 shows the calculations.

Table 9.4 Deferred Income Amounts

Calculated Amount	Results	Actual Amounts
Contract Total Amount =	Billed	1476.00
Billed / 365 days =	Daily Amount	4.04
Covered Days =	Base Date – Begin Date	182 – 94 = 62
Realized =	Covered Days*Daily Amount	4.04 * 62 = 250.00
Deferred =	Billed – Realized	1476.00 – 250.00



Chapter 10

PM Scheduling

You create and maintain service contracts for preventive maintenance just like any other service contract. However, preventive maintenance involves some unique issues. This chapter reviews service contracts from the perspective of these special requirements.

Business Background **336**

Setting Up PM Scheduling **336**

Scheduling Dates **340**

Creating PM Calls **341**

Business Background

Preventive maintenance (PM) is managed service that attempts to prevent breakdown or serious problems with an item. In preventive maintenance, calls are created according to a predetermined, regular schedule.

During the PM call, a service technician performs services on an item already in the installed base. These services typically involve cleaning, diagnostic checking, and replacement of consumable items such as inks, lubricants, toner cartridges, and high failure parts. Preventive maintenance is essential in some industries, such as aircraft maintenance, and has become standard in others, such as business copiers.

Without preventive maintenance, the traditional service contract is more or less an insurance policy, an agreement protecting the customer when something goes wrong with a product. With preventive maintenance, the service contract becomes a tool for managing an ongoing service relationship involving regular service engineer visits. Service contracts offer full preventive maintenance scheduling.

Setting Up PM Scheduling

Preventive maintenance scheduling is part of Contract Maintenance (11.5.13.1) and requires a new or existing service contract. How scheduling occurs depends on the value of Item End Users on the contract:

- When Item End Users is No, you can create schedules for each end user on the contract, for individual line items on the contract, or for a combination of the two.
- When Item End Users is Yes, only item schedules can be created.

End-User Schedules

Figure 10.1 illustrates the header Visits field in Contract Maintenance.

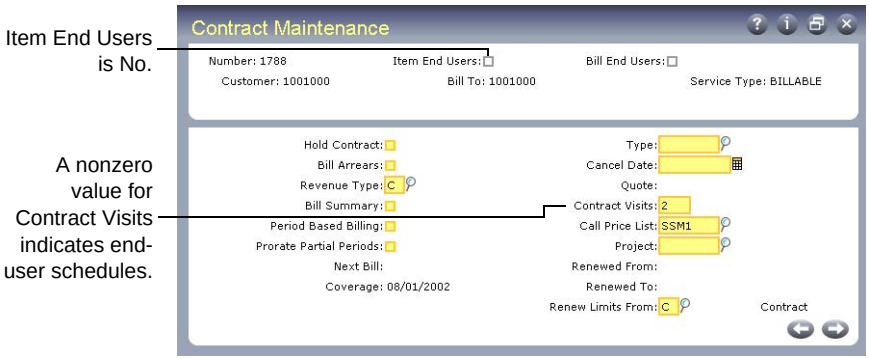


Fig. 10.1 Filling in Visits in Contract Maintenance (11.5.13.1)

To create a preventive maintenance schedule that applies to the each end user:

1. Specify a number of visits on the contract header. A nonzero value in this field activates scheduling. The number of visits indicates the number of times during the service contract duration that PM visits will be made to each end-user site. After you complete line-item entry, an End User PM Schedule window displays proposed dates for the PM visits.

   Note If you do not specify header visits, you can still generate PM schedules for individual contract line items.

2. Set the PM Item field to Yes for the items on the contract requiring visits. This field defaults to Yes if Days between PM is any nonzero value for the item in the Service Item Maintenance (11.3.7). When the system creates a PM call, it includes all items with PM Item set to Yes as line items, unless they already have individual schedules.

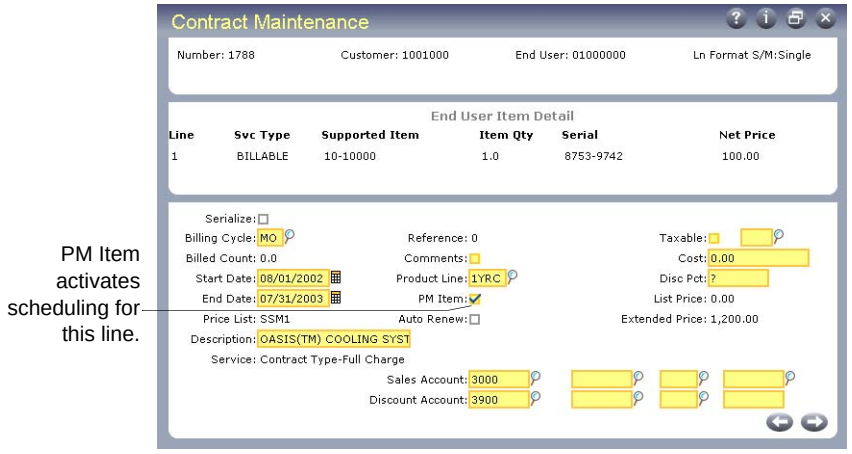
See Figure 10.2 on page 338.

Note If you create end-user schedules and none of the items on the contract have PM Item set to Yes, you can still create a call for the first visit, but it will not have any line items. This can be useful if you want to generate general follow-up calls at specific intervals.

Scheduling Visits for a Line Item

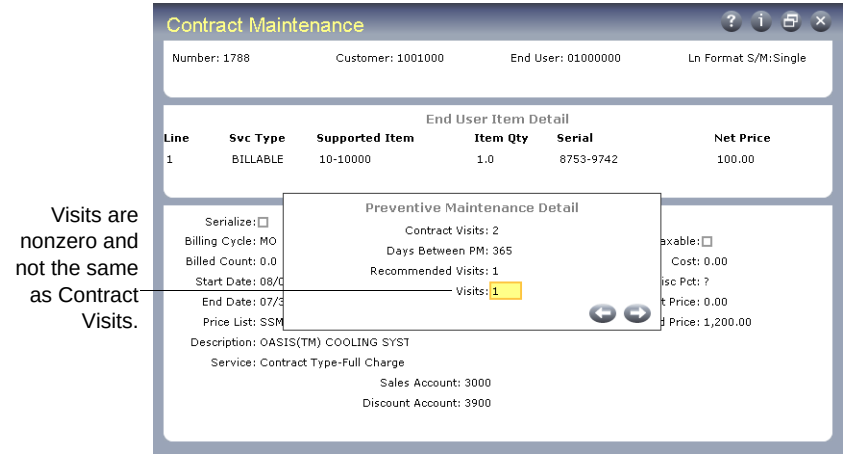
The PM Item field in Contract Maintenance must be Yes to set up preventive maintenance schedules for individual line items. This field defaults to Yes if Days between PM is any nonzero value for the item in Service Item Maintenance (11.3.7).

Fig. 10.2
Setting PM Item to Yes in Contract Maintenance (11.5.13.1)



A Yes in the PM Item field activates a PM detail pop-up window.

Fig. 10.3
Generating a Line-Item Schedule



If this contract is for end users with items, the Contract Visits field displays the value of the Visits field on the header. In item/end-user sequence, the Contract Visits field is always 0 (zero), since the field cannot be updated on the header.

The effect of the line-item Visits field varies depending on the value of Item End Users. When Item End Users is No:

- Leave the default 0 (zero) or enter the same number of visits as the end-user schedule to add this item to the calls created for the end user.
- Enter any other value to create a separate schedule for the item. The item schedule displays before the end-user schedule.

If Item End Users is Yes, an end-user schedule does not exist. Enter any nonzero value to create a PM schedule for this line item.

To help you determine how many visits to schedule for this item, the system displays the Days Between PM value specified for this item in Service Item Maintenance. Based on this number of days and the duration of the contract, the system recommends a number of visits.

Table 10.1 summarizes the settings for the PM Item and Visits fields when Item End Users is No.

Table 10.1
PM Item and Visits Field Settings

Desired Effect	PM Item	Visits
Exclude item from preventive maintenance	No	N/A
Include item in end-user PM schedule	Yes	0 or same value as specified on contract header
Generate separate PM schedule for this item	Yes	Any integer other than contract header value

Changing an Existing Contract

You can add a PM schedule to an existing contract by changing the number of visits to a nonzero value. When the system calculates the schedule, it divides the number of visits into the remainder of the contract duration.

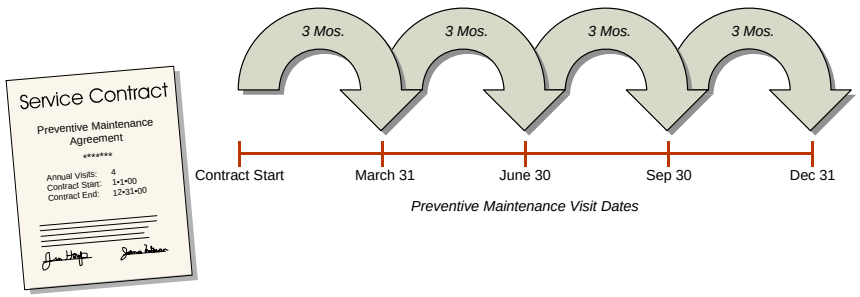
Tip
If you add more line items to a contract that have PM Item set to Yes, the system adds them to any existing scheduled call.

Once a schedule exists, the system does not recalculate it since calls based on it may already exist. If you change the number of visits when a schedule already exists, manually adjust the dates.

Scheduling Dates

Preventive maintenance visits are calculated by taking the length of the contract in days and dividing it by the number of PM visits requested for the covered item. The system then back-schedules the visits starting from the end date of the contract.

Fig. 10.4
Calculating Schedule Dates



This figure illustrates a a contract that starts on 1/1/00 and ends on 12/31/00. Four PM visits are requested.

1. The system divides the contract length in days by number of visits.

   365/4 = 91

2. Then, starting from the last day of coverage, the system back-schedules visit dates at approximate 91-day intervals. This would result in calls scheduled for March 31, June 30, September 30, and December 31.

Creating PM Calls

The first call in the PM schedule can be created directly in Contract Maintenance. Or you can manage the process yourself using the Call Generator.

Control Setup

Create PM Calls in Contract Control (11.5.24) determines whether the system generates PM calls in Contract Maintenance.

Create PM Calls is Yes

If Create PM Calls is Yes, the system generates scheduled calls automatically.

- The call associated with the first date on the PM schedule is generated before the PM schedule frame displays. While the entire schedule is predetermined, only one call is opened at a time.
- The next call is created when a scheduled call is closed. The system uses the schedule, based on the number of visits and contract duration information, to determine the next call's date.

Create PM Calls is No

If Create PM Calls is No, PM calls are not automatically generated. The system calculates dates and displays the schedule, but does not create the first call.

Note You can still generate a call from this PM Schedule frame by selecting a schedule date and pressing Go. The system then prompts you to create the call.

If you do not create calls during PM scheduling, you normally create them later with the Call Generator. Using the Call Generator, you can create all PM calls within a range of dates at one time.

See "Call Generator" on page 407.

Tip
Text entered in the Comment field on the PM Schedule frame before the call is generated is used for the call description.

Setting Create PM Calls to No is also useful if you want to use the BOM type feature, described next. If the system creates the call, you do not have the opportunity to specify a BOM type.

Using BOM Type

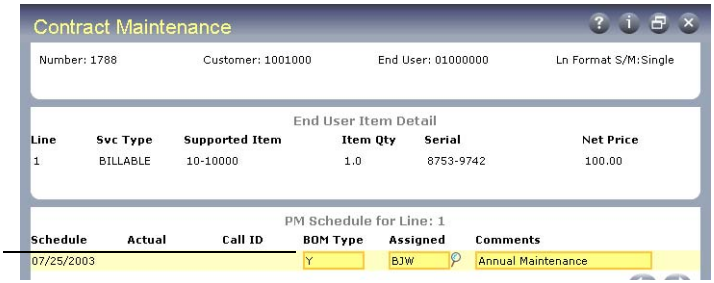
You can set up any number of service BOMs for a single item in Service Structure Maintenance (11.19.5). Similarly, you can set up multiple routings in Service Routing Maintenance (11.19.17). Service BOMs list the items normally used during a service activity, and the routings list the steps to follow.

However, you can associate only one PM BOM and routing with an item in Service Item Maintenance (11.3.7). The system uses this PM BOM and routing by default when a PM call is created.

Tip
Use the BOM Type if you have more than one standard PM BOM and routing.

You may have slight variations on a standard PM BOM and routing depending on how often you service the covered item. The BOM type enables you to create variations of a standard BOM and routing based on a type code. Set up BOM types in Generalized Codes Maintenance for field sap_bom_type.

Fig. 10.5
Contract Line-Item PM Schedule Frame



BOM type code is appended to PM BOM and routing codes.

Your standard BOM and routing may be slightly different for an annual visit, a quarterly visit, or a monthly visit. You can create three BOM types—A for annual, Q for quarterly, and M for monthly—and associate the appropriate one with the scheduled date. When the call is generated, the system determines the PM BOM and routing associated with the item in Service Item Maintenance. Then it appends the BOM type letter to this code.

Example Service item 113 is defined in Service Item Maintenance with a PM BOM code of 113-pm and a PM routing code of 113-pm. Now, in the scheduling frame of Contract Maintenance, you specify a quarterly BOM type (Q). The system-generated PM call would specify a BOM and routing code of 113-pmQ.

For this feature to work correctly, the BOMs and routings must have been created with Service Structure Maintenance and Service Routing Maintenance.

See Chapter 20, “Service Structures and Routings,” on page 659.

PM Call Default Values

The system uses the following information to determine the default values for automatically generated PM calls:

- Call default information for the PM work code, defined in Call Default Maintenance (11.1.21.10)
- End-user record
- Service contract type

You can control the way this call is defined by setting up special call defaults for the PM work code. For example, a separate queue is often set up for preventive maintenance with its own status codes and escalation sequences, if you are using call escalation.

Using the Call Generator

Use the Call Generator (11.1.8) to create PM calls for a range of dates and contracts at one time. The most important advantage of using the Call Generator to create PM calls is it gives you more control over the calls open date.

See “Call Generator” on page 407.

When the system generates calls in Contract Maintenance, the call open date is the current system date. In the Call Generator, you can specify a call open date. The call open date is important because it determines effective limits and levels of coverage.

Example You have a preventive maintenance schedule for an item that has a yearly PM interval. The first call is created from Contract Maintenance on 7/1/02, setting the call open date. The PM schedule date (6/30/02) sets the next event date on the call.

A year later, you dispatch an engineer to perform the PM service. Activity is recorded in CAR. The system looks for contract limits effective on the call open date (7/1/02). If you are using effective dates to provide phased coverage, the coverage effective when the service is performed may be quite different from the coverage provided a year ago. Based on the call open date, the system finds the older coverage.

Another drawback of creating calls far in advance is the extra load the calls place on the system for functions that need to search through the open calls.

For both these reasons, you may prefer to simply set up PM schedules in Contract Maintenance and create the calls closer to when the service needs to be performed. How frequently you generate calls can be affected by whether you are using engineer scheduling and how far in advance you want to schedule engineers.

Scheduling Subsequent PM Calls

PM calls are processed in Call Activity Recording like any other service calls. To schedule each subsequent PM call on a contract, you must first close the preceding one. Close a call by setting its status to the Close status as defined in Call Management Control (11.1.24). When you close a PM call, the system displays the close date in the Actual date field in the PM schedule frame.

If Create PM Calls is Yes in Contract Control when a call is closed, the system automatically generates the next call on the schedule. It uses the following values when creating the call:

- The next open date on the PM schedule becomes the new call’s next status date.
- If specified, BOM type determines the BOM and routing associated with the call.
- The Assigned Engineer on the PM schedule is associated with the call.
- Comments on the PM schedule are used for the call description.
- The open date of the new call is set to the close date of the previous one.

Note When a PM call is canceled, the next call is generated just as if the call had been closed.

When a PM call for an item in the installed base is closed, the system updates the installed base record. This update occurs regardless of the setting of Create PM Calls.

- The last PM date is updated to the call closure date.
- The next PM date is reset based on the last PM date plus the value of Days Between PM defined for the item.

Chapter 11

Call Management

A fundamental concern in service is the management of information flow between end users and your internal service operations. This means managing incoming calls. Calls record end-user interaction and maintain visibility over open problems and support needs. This chapter introduces calls and their management.

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What Is Call Management?

A call refers to a unique record of communication between the end user and the service organization. Each call identifies the end user, the nature of the problem or request, the urgency associated with that request, and the products involved.

The actual communication related to the call can take any form: telephone call, physical visit or service call, electronic mail. The call, in terms of processing, is a record used to track activity between the service organization and the end user and to generate statistics about this activity.

Call management handles all kinds of end user input, covering a range of needs. This input can be classified into three broad categories, indicating the level of response needed.

- *Inquiries.* These may be general questions about availability, releases of product, or marketing-related issues. Not tracking them can result in lost business. The callers do not have to be current customers.
- *Questions.* End users may have specific questions about the product. Some may be simple; others may require research for an answer, or, in some cases, reveal deeper issues or design problems that need more complex responses.
- *Service Needs.* Usually the primary concern of a service and support organization is to support the installed base. This may include installing new equipment, fixing broken equipment, correcting faulty design, or performing preventive maintenance.

When a call is created, it is created with the ultimate intention of closing it. Closing a call means the problem, question, or service situation has been resolved to your standards.

SSM functions work together to enable a service organization to:

- Create calls.
- Maintain visibility over call status.
- Change call status automatically based on user-defined criteria.
- Select an appropriate engineer for the call.

- Order items to service a call.
- Record activity—items, labor, expenses—for a call.
- Create invoices for service activity.

Other functions provide alternate ways of resolving calls, such as creating an RMA, RTS, or service request.

The operation of these functions depends on call setup and control program settings. These enable each company to tailor the call management process to their own business needs and requirements.

Setup for Call Maintenance

Call creation can be relatively simple or complex, depending on the system features you are using. The basic process requires the following:

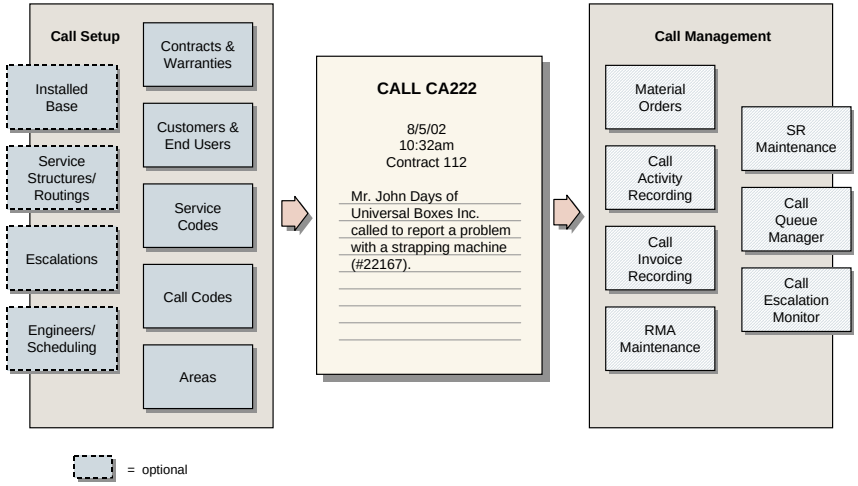
- Implementation decisions about the installed base must be made.
- You can create end users directly in Call Maintenance, but at least one customer must exist.
- At least one service type must exist to provide default coverage. If you provide warranties or contracts, you must define them. Associate warranties with service items in Service Item Maintenance.
- Set up codes, including call statuses, call types, and call queues, using the appropriate maintenance function. In addition, you should define some generalized codes.
- Set up call defaults to streamline data entry during call creation.
- Review and define the settings in Call Management Control to reflect your business practices.
- To record the service activity required to resolve a call and produce an invoice, set up the codes required for Call Activity Recording.

See Chapter 2, “Installed Base,” on page 19.

See Chapter 3, “Service Setup,” on page 79.

Other optional features you may want to set up include service structures and routings, escalations, areas, and engineers. Figure 11.1 illustrates functions related to supporting and resolving calls.

Fig. 11.1
Functions Supporting Call Management



Call Management

Once a call exists, you use other functions to manage and direct it through the system. Again, these functions are optional, since a call can simply be opened and closed. However, to meet the need captured by the call record, most organizations require a call management process that incorporates some or all of the features provided by the system.

Since call management covers a broad scope, different chapters cover different functions. This chapter covers the following main functions.

Call Setup (11.1.21). Definition of call codes, including statuses, types, and queues, and creation of call defaults.

Call Maintenance (11.1.1.1). Records calls and assigns service engineers. Records call information such as queue, status, date and time stamp, comments, and any other categorization of the call as it moves toward resolution.

Call Queue Manager (11.1.6). A call monitoring tool that sorts calls by attributes such as status, assigned-to, and priority. It also enables you to find a call and edit it directly in Call Maintenance.

Call Generator (11.1.8). This utility enables you to create a number of calls at once for a range of PM schedules or a range of installed base items and end users. If you use preventive maintenance scheduling but choose

not to create calls directly from Contract Maintenance, use the Call Generator to create them later. Generating calls for installed base items can be useful in case of a product recall or general upgrade.

The remaining call and call-related functions are covered in other chapters.

Call Quotes (11.1.1.7). Some service organizations, especially those that repair large and expensive items, go through a preview process before creating calls. The call quote functionality supports the creation of quotes for one or more line items with estimated labor, expenses, and items to be consumed. When the quote is accepted, you can turn it into a call.

See Chapter 12, “Call Quotes,” on page 421.

Escalation Monitor (11.1.13.13). Call escalation is an automated process that helps ensure calls are resolved. When enabled, the Escalation Monitor examines every call in the system and escalates each according to the set of escalation instructions you attach to the call.

See Chapter 15, “Call Escalation,” on page 551.

Call Activity Recording (11.1.1.13). Supports recording and tracking the items, labor, and expenses used in servicing a call. This data forms the basis for generating a call invoice.

See Chapter 13, “Call Activity Recording,” on page 437.

Call Invoice Recording (11.1.1.15). Call Invoice Recording gives supervisory personnel a tool for reviewing call activity call-by-call and generating and correcting a pending invoice for the activity.

See Chapter 14, “Call Invoice Recording,” on page 515.

Service Requests (11.1.15). You can link calls to service requests, which require longer-term changes to the product design, rather than to an individual item. Use service requests to relay information from the support staff to engineering. Repeated calls concerning the same problem can be handled by a single service request.

See Chapter 18, “Service Requests,” on page 601.

Return Material Authorization (11.7.1). A call can be linked for reference to a return material authorization (RMA). This is typically the case for items that require a simple replacement. This may occur when the item arrives in an unusable condition or the wrong item is ordered. If your organization does not do call billing, you can handle all repairs with work orders generated from RMAs.

See Chapter 21, “Return Material Authorizations,” on page 679.

Material Orders (11.11). You can use a material order (MO) to order items required to complete the activity for a call. The MO is then linked to the call and the items ordered on it must be consumed in Call Activity Recording or returned to stock.

See Chapter 19, “Material Orders,” on page 611.

See Chapter 16, “Engineers and Scheduling,” on page 563.

Service Engineers and Schedules (11.13). The individuals in the service organization who are responsible for resolving calls are normally set up as engineers. Use engineer scheduling functionality to streamline the assignment of engineers to calls in Call Maintenance. Engineer paging functionality enables an engineer to be paged when a new call is assigned.

See Chapter 17, “Area Maintenance,” on page 595.

Area Management (11.15). Set up and associate service areas with end users and engineers to assist in the call scheduling process. You can also set up default sites by area.

See Chapter 20, “Service Structures and Routings,” on page 659.

Service Structures and Routings (11.19). Service structures (BOMs) list the items normally required to complete a service activity, and service routings define the steps or operations that must be taken. If these are defined, you can specify them on a call and print them on the call as instructions to the engineer. You can also load them automatically into Call Activity Recording, greatly streamlining the data entry process.

Setting Up Calls

This section discusses setup issues directly related to calls: call status codes, call type codes, call queues, call defaults, and call control program settings. Table 11.1 lists functions on the Call Setup Menu (11.1.21).

Table 11.1
Call Setup Menu (11.1.21)

Menu Number	Description	Program
11.1.21.1	Call Status Code Maintenance	fscasmt.p
11.1.21.2	Call Status Code Inquiry	fscasiq.p
11.1.21.4	Call Types Maintenance	fsfctmt.p
11.1.21.5	Call Types Browse	fsbr028.p
11.1.21.7	Call Queue Maintenance	fscaqmt.p
11.1.21.8	Call Queue Browse	fsbr026.p
11.1.21.10	Call Default Maintenance	fscdfmt.p

Setting Up Call Status Codes

A call is managed according to its status, which relates to the call’s position in its life cycle. Is the call active, pending, an emergency, or closed? Calls are moved from status to status either manually or by the Escalation Monitor. Call Activity Recording also can make certain call status changes.

Create status definitions in Call Status Code Maintenance (11.1.21.1). You can set up as many status definitions as you need. Define up to five in Call Management Control for the system to apply. Unless you are using call escalation, you must apply other status changes manually. Therefore, you may want to keep the call life cycle simple.

Call status codes are user defined and can take any format an organization chooses. Some service organizations prefer numerical status codes or abbreviations. Others use more intuitive names.

Tip
Meaningful codes make it easier to understand quickly where a call is in its life cycle.

For example, when a new call comes in, its status can be OPEN. Later, when you assign an engineer to the call, the status becomes ASSGND. When the problem is resolved, the call status is CLOSED.

Call Activity Recording uses call status codes when it processes calls and makes decisions. In CAR, you assign statuses to the call and to the call line items.

Special Statuses

Certain statuses have special meaning to the call management programs. Define these special statuses in the Call Status frame of Call Management Control (11.1.24).

Open Status. This is the general status for an open call and the initial status for a new call, unless you are using escalations. An open call is dynamic; its item line and other data can change at any time.

Hold Status. The hold status prevents recording new activity or generating an invoice for a call or line in Call Activity Recording. A material order cannot be ordered for a call on hold. For anything further to happen to the call, change its status. You can still generate an invoice for existing activity in Call Invoice Recording, if necessary.

Complete Status. The complete status means the call is ready for invoicing—at least one invoiceable report with detail exists. However, you can still modify related data, order service items for it with a material order, and record new activity.

See “Call Status Changes” on page 411 for details on the requirements and effects of call closure.

Close Status. The close status is the final status of a call and indicates all service activity for this call is finished and ready for invoicing. Once a call is closed, you cannot record more activity or create material orders for it. However, you can reopen closed calls by changing their status. You can move closed calls to history and delete and archive them when they are fully invoiced.

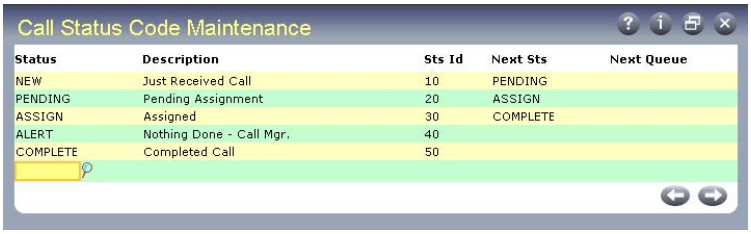
Cancel Status. Canceling a call is similar to closing it, but only a call without service activity can be canceled. You cannot generate an invoice for a canceled call since you cannot record activity for it.

These statuses are especially important in Call Activity Recording and Call Invoice Recording.

Call Status Code Maintenance

Define call status codes with Call Status Code Maintenance (11.1.21.1).

Fig. 11.2
Call Status Code Maintenance (11.1.21.1)



Status. Enter a unique name identifying this call status. Making the name recognizable can help users quickly identify its purpose.

Description. Enter up to 24 characters describing the code to help users identify its use and purpose.

Sts ID. This field can indicate the order in which statuses occur in the life cycle of a call. A lookup displays call statuses in numeric order as defined by the status ID, rather than alphabetically.

Next Status. Specify the next status that normally follows this status in the call life cycle. The next status specified here provides a default for the Next Status field in Call Escalation Maintenance when you define an escalation with a call status as part of the key. The system also uses it in the Next Status field of Call Maintenance if no other default is found.

Next Queue. Specify the next queue to which the system should route calls with the next status. This field is for reference; you can use it when setting up escalations.

Call Types

The call type code provides a user-defined way to categorize calls. Types are best for broadly classifying the reason for calls. For example, you may want to define different call types for marketing and sales calls, for operational questions that you often answer immediately, and for problems that require the attention of field service personnel. These business situations often require different kinds of call management.

Within each call type, you can use other call parameters such as work code to further qualify the call.

Define call types with Call Types Maintenance (11.1.21.4).

Fig. 11.3 Call Types Maintenance (11.1.21.4)

Call Type. Enter a unique name or code for this call type.

Description. Enter up to 24 characters describing the code to help users identify its use and purpose.

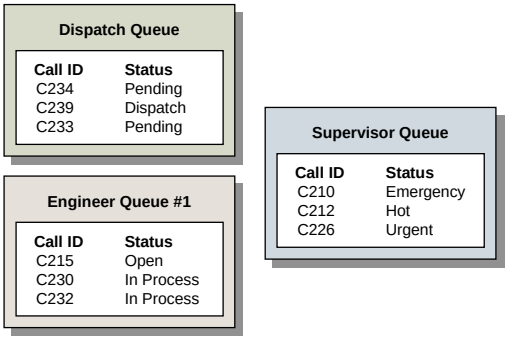
Call Queues

You can place each call in a call queue when you create it. The queue is a holding area you define to indicate who is responsible for the call. You also use queues with escalation sequences to redirect incomplete calls automatically so they obtain needed attention.

Sample Queues

Each queue is a unique place where calls are routed according to their problem, status, or other criterion. Queues are tools for locating and tracking calls. Use the Call Queue Manager to review and update calls according to queue. You define call queues to fit your service process. Figure 11.4 illustrates some sample queues.

Fig. 11.4
Sample Call Queues



In Figure 11.4, new, unassigned calls are placed in the dispatch queue, where they await assignment to an engineer. The engineer queue is for calls that have been assigned to engineers and are being resolved. The supervisor queue is for calls that must be brought to the attention of a supervisor. Each call has a status reflecting its urgency.

Call Queue Maintenance

Define as many call queues as you need in Call Queue Maintenance (11.1.21.7). Specify two queues—a default call queue and default quote queue—in Call Management Control. Unless you are using call escalation, you must move calls from one queue to another manually. Therefore, you may want to limit the number of queues to a well-defined set.

Fig. 11.5
Call Queue Maintenance (11.1.21.7)

Queue. Enter a name or code uniquely identifying this queue.

Description. Enter up to 24 characters describing the code to help users identify its use and purpose.

Setting Up Call Defaults

Tip
Set up defaults for call quotes with the same maintenance function.

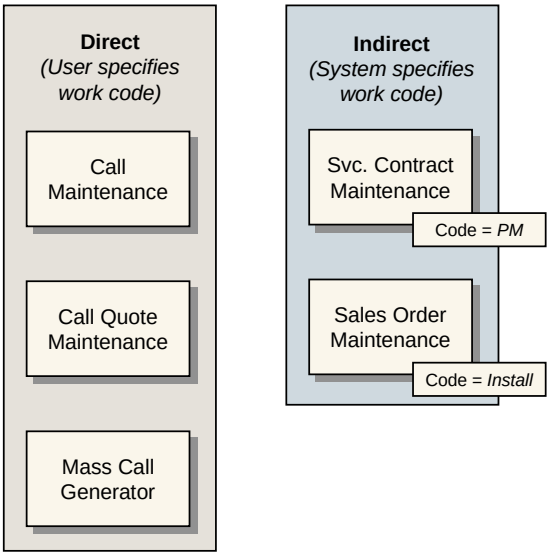
For most service organizations, calls generally fall into a small number of typical patterns. Streamline the data entry required for recording call information by setting up multiple sets of default call information to be applied to calls when they are created.

The call defaults serve as templates for the typical kinds of calls you take and are often based on work code. You can override the defaults for individual calls. For example, you might need to assign a problem/skill other than the default. To minimize changes for new calls, enter default information that is appropriate for as many calls as possible.

You can create calls directly and indirectly. Create them directly with Call Maintenance (11.1.1.1) or the Call Generator, or by releasing a quote to a call. Calls are created indirectly in either of two ways.

- The system creates PM calls as part of the scheduling associated with Contract Maintenance (11.5.13.1). PM calls are always created with the PM work code, as defined with Call Management Control, and any defaults set up for it in Call Default Maintenance (11.1.21.10). The PM call is set up in the same currency as its associated contract.
- The system creates installation calls when you post a sales order or RMA invoice and an item on the order is defined as requiring an installation call. Installation calls are always created with the install work code, as defined with Call Management Control, and any defaults set up for it in Call Default Maintenance. The install call is set up in the same currency as the sales order that initiated it.

Fig. 11.6
Call Defaults Used in Call Creation



See “Call Default Precedence” on page 362 for details on the order in which call defaults are processed.

Regardless of how the call is created, the system searches for an appropriate set of defaults when it builds the call record. When you create calls or call quotes manually and call or call quote defaults exist, a pop-up enables you to specify the values for the system to use in searching for appropriate values. If no defaults exist, this pop-up does not display.

Using Call Defaults with Escalations

You can use call defaults in conjunction with escalations. If both are in effect when you create a call in Call Maintenance, some defaults may not be used. When you create a call directly in Call Maintenance, the escalation sequence *always* determines the values for Status, Next Status, and Queue.

Calls created by the system in the background—installation calls from invoice post and PM calls from contract schedules—are not initially affected by escalations. This is because these calls are normally scheduled some time in advance. The system escalates the call only after the call reaches the next status date and time initially set by the system.

Default Key Values

Call defaults are built around three key call attributes: work code, model, and service group. When you define a set of defaults, you use one or more of these keys. Then when you create a call in Call Maintenance, you can select the set of defaults you want to use based on this key.

If the system cannot find a set of defaults that matches the values specified on the Call Defaults pop-up, it continues looking for less exact matches. The system looks for call defaults with any combination of values in the key in the sequence listed in Table 11.2.

Table 11.2 Search Order for Call Default Key Values

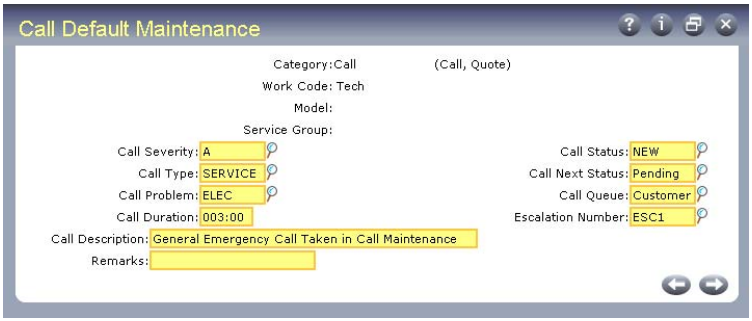
Search Order	Work Code	Model	Service Group
1	✓	✓	✓
2	✓	✓	
3	✓		✓
4		✓	✓
5	✓		
6		✓	
7			✓
8			

Note The value the system uses for category in the search is determined by the program executing the search. From Call Maintenance, category is always call. From Call Quote Maintenance, category is always quote.

Call Default Maintenance

Define default call information with Call Default Maintenance (11.1.21.10).

Fig. 11.7
Call Default Maintenance (11.1.21.10)



Category (Call/Quote). Category must be either Call or Quote and determines where the defaults are used. Call Maintenance uses only call defaults with a call category. Call Quote Maintenance uses only defaults with a quote category. To define a set of generic defaults for all calls, specify call in the Category field and leave the other key fields blank.

See “Work Codes” on page 82.

Work Code. This field can be blank. If specified, it is part of the default search key, and enables you to base call defaults on the kind of work being done. Work codes provide a general means for categorizing the kind of work needed to address a call, and tie into invoicing and service limits. Define work codes with Work Code Maintenance (11.21.1).

Define default work codes in Call Management Control (11.1.24). The system uses these defaults when calls are created: the technical work code when calls are created with Call Maintenance, the install work code for automatically generated installation calls, and the PM work code for automatically generated preventive maintenance calls.

Tip
Set up codes in Generalized Codes Maintenance for field pt_model.

Model. This field can be blank. If specified, it is part of the default search key. Specify the model when you set up an item with Service Item Maintenance (11.3.7). Model is maintained as part of the installed base record also.

Service Group. This field can be blank. If specified, it is part of the default search key. You can assign an item to a service group in Service Item Maintenance (11.3.7). Service groups provide a way to group service cost according to any user-defined criteria.

Tip
Set up codes in Generalized Codes Maintenance for field pt_svc_group.

The remaining fields on this frame, except for Remarks, define the actual default information the system uses in Call Maintenance or Call Quote Maintenance. The Remarks field is for reference only; use it to enter remarks about the current defaults.

Example Call default information is established for a preventive maintenance call (work code PM).

Define defaults for the PM work code.

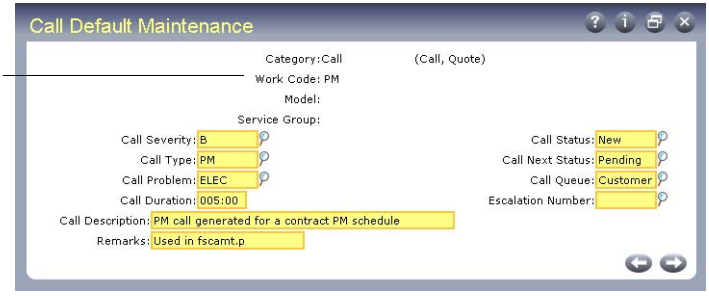


Fig. 11.8
Call Defaults for PM Work Code

When a user reviews a system-created PM call, it looks like Figure 11.9. The system has loaded the correct default information into the call.

Defaults display when you view the PM call in Call Maintenance.

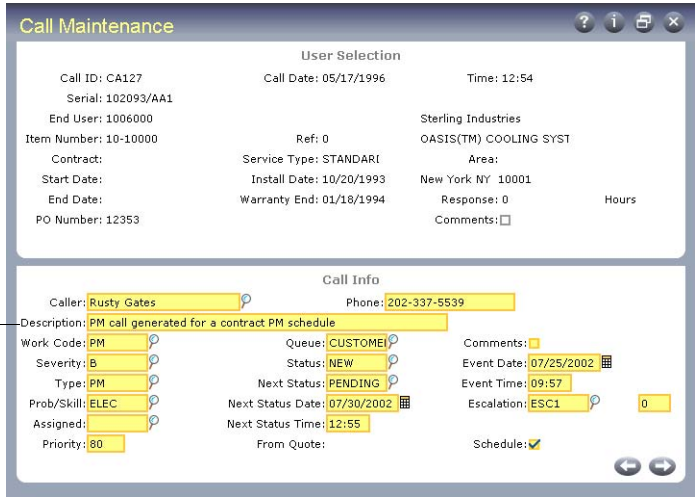


Fig. 11.9
Call Defaults Displayed in Call Maintenance

Call Default Precedence

To provide the most flexibility in setup and implementation, you can define call defaults in a number of ways. Service organizations with simple requirements may set up only a few very generic defaults. As requirements grow and change, you can refine these defaults.

Since defaults may exist in more than one place, the system follows the rules summarized in Table 11.3 to determine default precedence.

Table 11.3
Call Default Precedence Rules

Field	End User	Call Default	Escal. Seq.	Cont./ War.	User Pref.	Control Program	Other
Description		1					
Duration		1				2	
Escalation	1	2			3	4	
Next Status Date/Time			1				
Next Queue			1				2 Call Status
Next Status		2	1				3 Call Status
PO Required	1						
Priority	1		May bump		4	3 Def Serv Type	2 War/ Serv Type
Problem		1					
Queue		2	1		3	4	
Service Type				1		2	
Severity		1	2				
Status		2	1			3	
Time Window					1	2	
Type		1	2				
Work Code						1	
Structure Window					1	2	

Note Calls created by the system in the background—installation calls from invoice post and PM calls from contract schedules—are not initially affected by escalations. This is because these calls are normally scheduled in advance. The call is escalated only after the call reaches the next status date and time initially set by the system.

Control Settings

Service Management Control (11.24) and Call Management Control (11.1.24) affect call creation, call tracking, escalations, and call queue management. This section discusses some settings in these functions that are especially important.

See Chapter 23, “Control Programs,” on page 745 for complete descriptions of control program settings.

For Which Items Can You Take Calls?

Service Management Control determines whether you can take calls only for items in the installed base, for any item defined in the item master, or for any item at all.

- Set Items In Installed Base to Yes to restrict the calls you take to items in the installed base. Setting this field to No enables you to take calls for any item.
- Items Must Exist determines whether you can take calls only for items that exist in your item master. This setting is generally used to restrict service to items you manufacture and sell.

See “Restricting Support to the Installed Base” on page 35.

Default Call Service Type

If you are using warranties or contracts, most items referenced on calls already have terms and conditions of coverage. If you are not using these sources of coverage or if not all items you service are covered, specify a service type to determine basic coverage conditions required by the call.

Specify the default service type in Call Management Control (11.1.24). It sets the response time, priority, and coverage hours for items that have no coverage.

See “Charge and Revenue Management” on page 103 for more information on charge codes.

The service type in the control program must be a contract type defined with Contract Type Maintenance. Normally, this contract type is used when you bill for time and materials and provides no coverage. If any coverage is provided on this service type, create it with an associated charge code of Covered.

Calls from Unknown Users

Every call must reference a valid end user, and every end user must be attached to a valid customer. Some service organizations regularly receive calls from end users who are not already registered in the installed base. This is typical for products sold through retail outlets when the customer does not contact you unless something goes wrong.

Since Call Maintenance is often used in an interactive mode, you can take calls for unknown end users without having to set up a valid customer in Customer Address Maintenance. You first create a dummy customer in Customer Address Maintenance. Then you specify this customer number in the Temporary Customer field in Call Management Control.

Now, when you take a call, leave End User blank. A pop-up window enables you to create a new end user. By default, this end user is associated with the temporary customer. In this way, the call is taken smoothly and a record established.

Whether you can record activity against this call or close it depends on the Call Activity with Temp field in Call Management Control. If you do not want activity recorded against the temporary customer, set this field to No.

In this case, create a customer for the end user in Customer Maintenance and then add the caller as an end user of this customer, using End User Address Maintenance (11.9.1). Finally, modify the call to reference the valid end user.

Assigning Engineers to Calls

Two approaches can be used to assign engineers in Call Maintenance, represented by two fields in Call Management Control.

- *Schedule New Calls*. If Yes, the Schedule field defaults to Yes in Call Maintenance, initiating the engineer scheduling sequence. This sequence follows a set of rules in ranking potential engineers and enables you to select one or more to be assigned to the call.
- *Assign Primary Engineer.* Rather than scheduling engineers, you can designate an engineer who typically works on an end user's items. If Assign Primary Engineer is Yes, the system assigns, by default, the end user's primary engineer to new calls.

Tip
Assign a primary engineer to the end user in End User Address Maintenance.

If both these fields are Yes in Call Maintenance, the system assigns the primary engineer and you can assign additional engineers. Note, however, that if you select the primary engineer again, the system creates two engineer transaction records for the primary engineer, each with an estimated number of hours the system considers part of the engineer load for scheduling purposes.

If you use engineer scheduling, you probably also want to set Call Time Window to Yes in Call Management Control. When this field is Yes, the Travel and Estimated Time window appears in Call Maintenance, enabling you to enter an estimated time for the engineer. If this window does not display, the system uses the default estimated times for the appropriate work code in Call Management Control.

The estimated call length is important, because it is used to calculate engineer availability during call scheduling if Display by Calls is No in Engineer Schedule Control.

Creating and Updating Calls

The primary program for managing calls is Call Maintenance (11.1.1.1). Call Maintenance controls calls from a variety of perspectives.

Call Information. Where is a call placed in your support organization (Queue)? How is it categorized (Problem, Type, Severity)? When should it be updated (Next Status Date and Time)? Where is the call in relation to the call life cycle (Status)?

Management. How should the system manipulate the call to ensure that it is addressed in a timely fashion (escalations)?

Engineer Assignment. Which service engineer should be assigned to work on this call? Who is best equipped for the particular problem? Who is available to do the work?

Repair Information. What items and procedures should be used when servicing the call items?

Service Summary Information. What problems were encountered on this call? How were they resolved?

Call Entry Overview

Enter calls in Call Maintenance (11.1.1.1), illustrated in Figure 11.10.

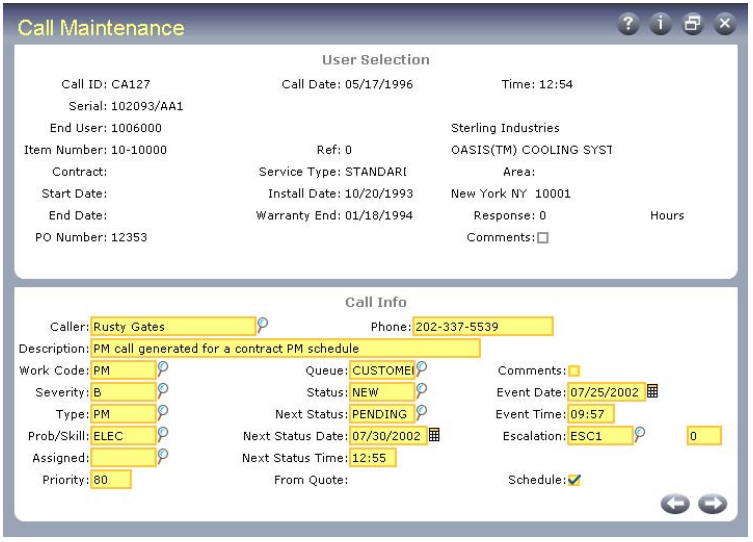


Fig. 11.10
Call Maintenance (11.1.1.1)

Entering calls in Call Maintenance is easy, since it is often used in an online environment where support personnel enter information as they interact with end users. Some of the features that facilitate data entry include the following:

- The system automatically generates call numbers from the Call Prefix and the Next Call ID fields in Call Management Control.
- If you receive a call from a new end user, you can define the end user directly in Call Maintenance, without having to add a detailed end-user record in End User Address Maintenance (11.9.1).
- You can look up end users in a variety of ways using the End User Selection pop-up.
- The system retrieves the coverage detail from the warranty defined with Service Item Maintenance or the active service contract. Otherwise, it uses the default service type defined in Call Management Control.
- If the end user has been set up to require a purchase order for service, you can enter it on the first frame. This prevents wasting time on calls that cannot be serviced.

- You can enter call comments from the first frame, so you can record the details reported by the end user immediately, and make decisions about other fields later.
- You can establish various default values for most call fields.

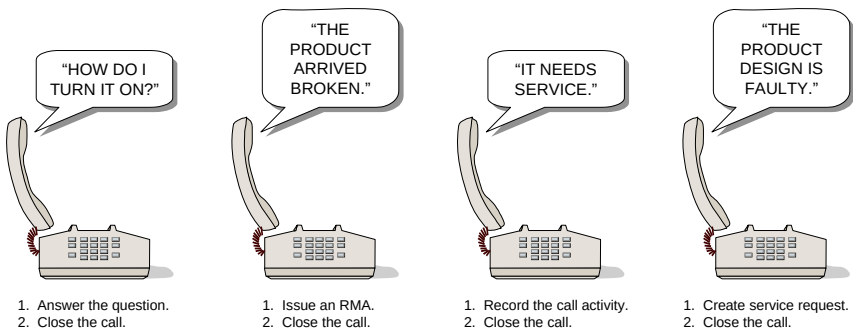
See “Setting Up Calls” on page 352.

Call Life Cycles

Once a call record exists, other service functions can be used to resolve it. You can print output from data entered on call records. Printed calls are not simple reports. They are the service engineer’s guide for work to be performed. Printed calls include information about the customer, end user, call items, and comments. You can direct the system to print the items and operations required in the service activity.

Call Maintenance handles incoming calls of all kinds. In Figure 11.11, four types of calls are routed to separate operations. In actual practice, a single call might include all these scenarios.

Fig. 11.11
Call Life Cycles


“HOW DO I TURN IT ON?”
1. Answer the question.
2. Close the call.
“THE PRODUCT ARRIVED BROKEN.”
1. Issue an RMA.
2. Close the call.
“IT NEEDS SERVICE.”
1. Record the call activity.
2. Close the call.
“THE PRODUCT DESIGN IS FAULTY.”
1. Create service request.
2. Close the call.

Questions

For simple calls, the support engineer answers the caller’s question and closes the call. Usually the service organization wants to track these inquiries. For example, a support department can create a database of frequently asked questions and use it for training and quick resolution of calls on the front line. The same database often provides useful feedback to other departments.

RMAs

Handle simple replacement calls that do not require an on-site engineer by issuing an RMA.

Call Activity Recording

Calls regarding product failures may require a visit by a service engineer. Replacement items may be needed, items may need to be returned to the factory for repair, or an entire system may need to be shipped back and replaced. Preventive maintenance and installation calls are two other types of calls that require the intervention of an engineer. Information from the call is used to resolve billing issues associated with the service activity.

Service Requests

Recurring problems reported by calls can result in the creation of a service request. You can use service requests internally to track problems that may require product design changes.

Updating Call Records

When a call is linked to an RMA or an SR, the link is by reference only. RMA Maintenance and SR Maintenance use information from the call record, but they do not operate directly on it, other than to create the reference link.

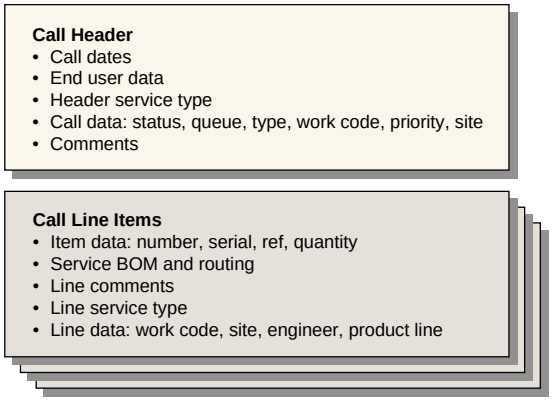
This is not true of the relationship between Call Maintenance and Call Activity Recording. Call Activity Recording is an extension of Call Maintenance. The call record is directly updated from both functions.

Call Record in Call Maintenance

The call record created in Call Maintenance has two parts: the header information and call line information. This distinction is not as clear in Call Maintenance as it is, for example, in RMA Maintenance, where line items are specified in a separate frame. To streamline taking calls and retrieving information from the installed base, you specify the first call item directly in the call header. But the logical distinction remains.

Figure 11.12 illustrates the two levels of information. There can be many call items, but only one call header.

Fig. 11.12
Call Header and Line Items


Call Header
• Call dates
• End user data
• Header service type
• Call data: status, queue, type, work code, priority, site
• Comments
Call Line Items
• Item data: number, serial, ref, quantity
• Service BOM and routing
• Line comments
• Line service type
• Line data: work code, site, engineer, product line

The call header provides defaults for some of the line item data. You can modify these elements in the header and at the line level.

Call Record in Call Activity Recording

See Chapter 13, “Call Activity Recording,” on page 437.

In Call Activity Recording, you can update some of the fields of the call record created in Call Maintenance. Most of the header fields are display-only in CAR and cannot be changed. Line item data can be changed. However, CAR adds a layer of data beneath the line item: the report. Use the report to record the details of labor, expense, and item usage.

Figure 11.13 illustrates the addition of the report level, below the call line item. Each line can have one or more reports.

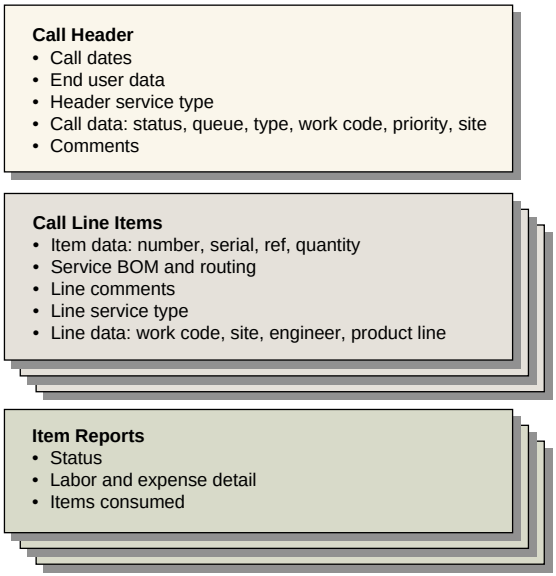

Call Header
• Call dates
• End user data
• Header service type
• Call data: status, queue, type, work code, priority, site
• Comments
Call Line Items
• Item data: number, serial, ref, quantity
• Service BOM and routing
• Line comments
• Line service type
• Line data: work code, site, engineer, product line
Item Reports
• Status
• Labor and expense detail
• Items consumed

Fig. 11.13
Call Header, Line Items, and Reports

After a report has been created for a call line item, you cannot modify many of the fields associated with the line. This is true in CAR and in Call Maintenance, since they update the same record.

- The end user on the call. Contract coverage is specific to end users, and warranty can be based on end-user type. The end user also determines the call's customer and default bill-to in Call Activity Recording.
- The item number, serial, and reference, which define the item being repaired. The system uses this information to calculate the service type and applicable coverage limits, as well as the default BOM and routing for service activity.
- The quantity of the item. The system multiplies the operation run time and item quantity on the service BOM and routing by the quantity of the item being serviced and also used in installed base updates.
- The service type and work code. The system uses the work code to calculate applicable service limits and determine if the repair is for a fixed price or not. Once you begin recording activity, you cannot change these features.

- The site associated with the item, which CAR uses to determine where service inventory is located.
- The BOM and routing associated with the item, which are exploded in the first report for the item in CAR, defining the default set of items used and operations performed.

Active Call History

The system keeps track of events related to a call in a call history table (ca_hist). The records in this table are updated when:

- A call is created in any of the following ways:
  - Call Maintenance (11.1.1.1)
  - Automatically in Contract Maintenance (11.5.13.1) for scheduled PM calls
  - Automatically in Invoice Post (7.13.4) for installation calls
  - By using Call Quote Release to Recording (11.1.1.11) to release a quote to a call
  - By using the Call Generator (11.1.8) to create a group of calls
- A call is modified or reviewed in Call Maintenance.
- The call status is changed in Call Maintenance, Call Activity Recording, Call Queue Manager, or Engineer Call Schedule Maintenance.

As a result, this table shows the history of all status changes to a call and when they occurred. The first record always indicates the current call information.

Status history may be important for generating reports in a regulatory environment. View call history using Call Detail Inquiry (11.1.1.3). Fields tracked in history include the status, priority, assigned engineer, problem, next status, next status date and time, and the event date and time.

See “Moving Calls to History” on page 417.

Note The active call history table is not the same as the call history table used for keeping an online history of inactive calls.

Call Currency

You do not normally specify currency for a call until you initiate service activity in Call Activity Recording, since billing information is created in CAR. In some cases, however, currency is set in Call Maintenance and you cannot change it in CAR.

Only one currency can be associated with a call, which means that all call lines must be in the same currency. This limitation is imposed by sales order processing, which is the basis of call billing.

Each contract line also reference a currency, which defaults from the end user associated with the line. Any coverage limit amounts on the contract line are defined in terms of the contract-line currency. To apply those limits correctly, the call currency and the contract-line currency must be the same.

See “Contract Currency” on page 251 for details.

As soon as you add an item to a call that derives its coverage from a contract, the call’s currency is set in Call Maintenance and cannot be changed. Any other lines added in Call Maintenance or later in CAR that are covered by a contract must use the same currency, or an error is generated.

Credit Standing and Calls

Credit Hold Option in Service Management Control affects how calls are processed when the customer associated with the end user initiating the call is on credit hold. This field can have one of three values:

0 (zero): Service calls are accepted regardless of the customer’s credit status.

1: Service calls are accepted, but a warning displays when the customer is on hold.

2: Service calls are not accepted from customers who are on credit hold. An error message displays and you cannot record the call until the customer Credit Hold field is reset to No.

Call Management and Multiple Time Zones

See Chapter 4, “Multiple Time Zones,” for complete details regarding setting up and using MTZ.

Multiple Time Zones (MTZ) is an optional feature of SSM that enables you to manage your response to end users located in more than one time zone. Activating MTZ affects time-sensitive data in key service functions including call management, engineer scheduling, coverage checking, creation of installed base records, and reports and inquiries that display dates and times.

MTZ has its most pervasive effect in Call Maintenance and call-related functions where most dates and times are displayed relative to the end user’s time zone.

The screens illustrated in this chapter all assume that MTZ is not being used. To review alternate versions of the screens with MTZ active, see “Time Zones and Call Management” on page 142.

Determining Call Coverage

A call record includes information identifying an end user and an item. Once an item is uniquely identified in Call Maintenance, the system searches for valid coverage. This search occurs in the first frame of Call Maintenance, since coverage determines some of the other values of the call, such as:

- Response time, indicating how long it should take to get back to the caller
- Priority, indicating how important the call is
- Coverage hours, indicating the business hours service is available

The system uses coverage hours in conjunction with response time to calculate the call’s next status date and time, which is important for call scheduling.

Coverage may be found on a warranty or service contract. If the system finds neither, it uses the Default Call Service Type in Call Management Control.

Coverage and Call Dates/Times

The system looks at various information to suggest a timing sequence for events related to a call. When a call is first created in Call Maintenance, the event date and time reflect the current system date and time. Event date and time update each time you access the call from Call Maintenance or it is escalated by the Escalation Monitor.

If you are not using escalations, the system considers two factors when calculating the call's next status date and time:

- The response time from the call's service type. Response time is an agreed-upon time within which you want to respond to a call from your customer.
- The coverage hours defined for the call's service type. These specify the days and hours your organization is open for service.

Example You take a call at 4:00 PM (16:00 hours) with default coverage. The default service type specifies a 4-hour response time. Your coverage hours are 8 AM to 5 PM, Monday through Friday. If response time is simply added to the call event time, a next status time of 8 PM (20:00 hours) would be calculated. This would create a problem, since you are only open until 5:00 PM (17:00 hours).

Since the system knows your service coverage hours are only until 5:00 PM, it schedules the next event three hours into the next business day.

If you are using escalations, the calculation of next status date and time is determined by the days and time allowed in the status of the first escalation step. The Escalation Monitor also checks the Use Calendar Days in Escalation field to determine whether to use calendar days or work days in the calculation.

See "Use Calendar Days in Escalation" on page 562.

Multiple Sources of Call Coverage

For each item on a call, more than one source of coverage can exist, and each can have different terms and conditions.

- A warranty associated with an installed base record can exist for the item.
- A contract can exist with a line for the specific item/serial/reference number.

- A second line for exactly the same item can exist on the same contract with a different service type. This enables you to use different service types and price lists for different hours of coverage. In this case, a call taken during the day could receive one kind of coverage, one taken at night another.

See “Blanket Coverage” on page 257.

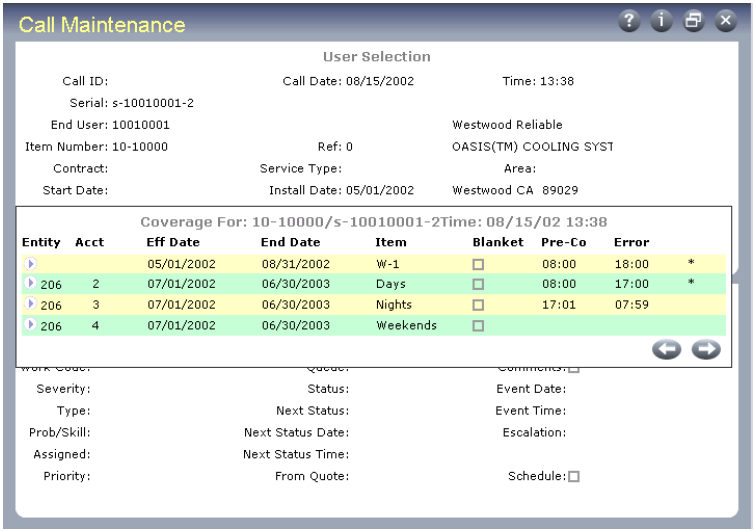
- A blanket contract may exist for the end user and item, covering all items with this number.
- A blanket contract may exist for the end user with a blank item, covering any items for this end user.

Tip
This lookup displays when you create a call or add more lines to it in Call Maintenance or Call Activity Recording.

Whenever multiple coverage sources exist, you can select the one to be used for the call. A lookup lists each coverage source, the start and end date, service type, whether a contract is a blanket contract, and the hours of coverage. The more specific coverage sources are listed first.

Figure 11.14 illustrates how this window appears in Call Maintenance.

Fig. 11.14
Coverage Pop-Up in Call Maintenance



In this example, four coverage conditions exist for the item. It has a valid warranty that expires on 08/31/2002. It is covered specifically by contract 206 with three types of coverage: days, nights, and weekends.

The asterisk in the right-most column indicates the call time falls within the coverage hours specified on the associated service type. In this example, the day coverage does not have an asterisk, since the call was taken in the evening. The weekend coverage also does not apply.

The lookup lists the coverage records in the following prioritized order.

1. Warranty for an installed base record.
2. Contract with a line for the specific item/serial/reference number using a service type with coverage hours that include the call open time.
3. Contract with a line for the specific item/serial/reference number using a service type with coverage hours that do not include the call open time.
4. Blanket contract for the end user and item covering the call open time.
5. Blanket contract for the end user and item not covering the call open time.
6. Blanket contract for the end user covering the call open time.
7. Blanket contract for the end user not covering the call open time.

It is unlikely that any one item would have all these coverage sources. The lookup appears only if more than one source of coverage exists. If you do not select one of the listed coverage sources, the system uses the first by default.

When it creates calls in the background, the system uses alternate methods for determining the coverage to select, based on a standard method of prioritizing coverage sources.

- Installation calls created during invoice post always use warranty coverage, if available, then the highest prioritized contract coverage.
- Coverage for calls created in the Call Generator is based on your input selection of Warranty or Contract.
- PM calls created as part of Contract Maintenance always use the contract from which they are generated.

Call Open Date/Time and Coverage

Tip
If MTZ is active, open date and time are relative to the end user's time zone.

When the system searches for call coverage, it uses the call open date and time. It also determines if the day is a holiday.

For contract coverage to be considered valid, the call open date must be within the range of the contract line's start and end dates, and the contract currency must match the call currency. If more than one coverage source exists, the system checks the call's open time to see if it fits within the range of available hours for the service type associated with the contract line.

The same algorithm is used to determine consumption of contract limits when you post a call invoice. The call open date is used to determine the effective limits. You cannot update the start and end dates of a contract header or line to exclude an attached call's open date. This is also true of limit records: you cannot modify the effective dates to exclude the open date of a call that references them.

Call Maintenance

This section gives field-by-field reference information for Call Maintenance (11.1.1.1). Some frames are required, others display depending on field settings. Each frame listed in Table 11.4 is described in detail in the following sections.

Table 11.4
Call Maintenance Frames

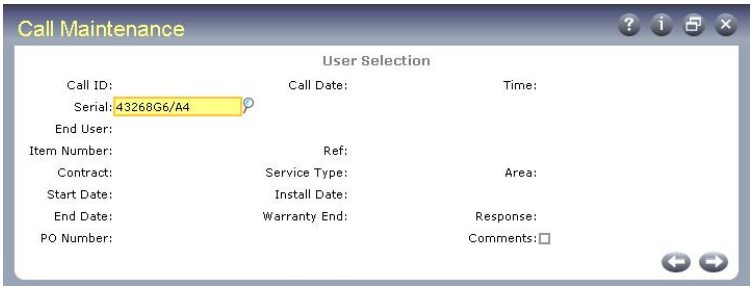
Frame	Req	Purpose
User Selection	Y	Enter information identifying the item and end user initiating this call.
End User Selection	N	If End User is blank, displays so you can select an end user.
End User	N	Enables you to create a new end user.
Calls for End User	N	If new call and other calls exist for end user, enables you to cancel the call you are creating and switch to an existing call.
Comments	N	If Comments is Yes in call header, enter comments detailing the problem reported by the user.
Call Defaults	N	Specify values used to search for applicable call defaults.

Frame	Req	Purpose
Call Info	Y	Enter or modify detailed information related to the call.
Travel and Estimated Time	N	If field is Yes in Call Management Control or user preferences, modify call duration and travel time.
Override Scheduling Options	N	If Schedule is Yes in the Call Info frame and Override Scheduling Options is Yes in Engineer Schedule Control, choose options for limiting engineers for scheduling.
Call Scheduling	N	If Schedule is Yes in the Call Info frame, select appropriate engineer for call.
Call Engineer Schedule Maintenance	N	If Schedule is Yes in the Call Info frame and appropriate schedules are available, modify start and end date or estimated time.
Comments	N	If Comments is Yes in the Call Info frame, view or update call header comments.
Item Service Structure Detail	N	If field is Yes in Call Management Control or user preferences, modify site, BOM, and routing associated with call's first item.
Call Update	Y	Enter final details about the call and select other optional frames.
Paging	N	If Page Engineer is Yes (see page 398) in the Call Update frame, page the engineer assigned to the call.
Call Item	N	If Multi Items is Yes in the Call Update frame, view details about call item or add more items to the call.
Coverage Information	N	If Coverage is Yes in the Call Update or Call Item frame, view coverage information related to this item.
Comments	N	If Comments is Yes in the Call Update or Call Item frame, view or enter comments about this call line.
Fault Codes	N	If Fault Codes is Yes in the Call Update or Call Item frame, enter codes for this item.
Call Print	N	If Print Call is Yes in the Call Update frame, enter output device for the print function.

User Selection Frame

Use the user selection frame to specify or create the end user initiating the call and record the item and associated information. Once you enter an item, the system displays its warranty or service contract information. You can also record comments about the call.

Fig. 11.15
User Selection Frame



Call ID. Enter a number or let the system generate one based on the call prefix and next call number in Call Management Control. Calls must have a unique prefix to distinguish them from quotes. The call ID identifies a call as it moves through its life cycle.

Serial. Enter the serial or lot number of the item being reported, if available. If the end user is calling about an item in the installed base, you can use this field to retrieve end user, item, and warranty information. If the item you enter in the Item field is defined as serial or lot-number controlled, a warning displays if you do not specify a number. The installed base cannot be updated until a number is provided.

Tip
Leave this field blank to create a new end user or select end users based on phone, zip code, or other attributes.

End User. Enter the end user initiating this call. If specified, the end user must have been previously defined. If you want to select end users by attributes other than their name, you can leave this field blank to display an End User Selection frame. You can also create end users directly from Call Maintenance by leaving this field blank and answering Yes when prompted to create a new end user on the following frame.

A number of data elements associated with the call can default from the end-user record. These include: Area, Caller, Phone, Priority, Assigned, Escalation, Travel Distance, Travel Time, and Time Zone (if MTZ is active). The call scheduling sequence uses information associated with the end user to award points to engineers (area,

primary and secondary engineer, and time zone). The end user also determines the customer and default bill-to addresses for Call Activity Recording and Call Invoice Recording.

If you press Go with a blank End User field, the End User Selection frame appears. Use this frame to find an appropriate end user record for the call.

See “End User Selection Frame” on page 383.

If you are creating a call for an end user that already has other calls, the system prompts you to display these calls when you press Go. Selecting a call from this window replaces the call you were about to create. Use this feature to combine calls for the same end user.

See “Calls for End User Pop-Up” on page 384.

You cannot change the end user associated with a call after you open reports in Call Activity Recording.

Item Number. Specify the number of the item requiring service. If the end user supplied an installed base serial number, the system fills in this field. If this item is in the installed base, it must belong to the end user entered previously.

If Items Must Exist is Yes in Service Management Control, this field is validated against items defined in the item master. If Items in Installed Base is Yes, the item must also exist in the installed base before you can take a call for it.

Tip
Two control program settings affect the validation of this field.

If System Level on Calls is Yes in Call Management Control, the next/previous processing in this field is affected. Only items in the installed base that have a system type that matches the system type specified for System Level in Service Management Control display.

If the item you enter has been set up in the item master as serial-controlled, a warning displays if you do not specify one. The installed base cannot be updated until a serial number is provided.

Ref. Specify an installed base reference number to uniquely identify this item. If you leave the Ref field blank or enter a question mark (?), the system suggests the next available reference number by scanning current ISB records.

Tip
Do not confuse ISB reference numbers with inventory reference numbers.

Reference numbers are used in the installed base for non-serial controlled items to ensure the item identification is unique. The ISB reference should not be confused with the inventory reference

number. While they both uniquely identify items, the ISB reference identifies items in the installed base; the inventory reference identifies items in inventory.

The Contract, Service Type, Start Date, Install Date, End Date, Warranty End, and Response fields default from any contract or warranty associated with the specified item/serial/ref combination or the standard coverage defined in Call Management Control. Area defaults from the end user.

PO Number. Specify a purchase order number for the service associated with this call. This field is required if the end user reporting the problem has been defined in End User Address Maintenance as requiring a purchase order. The field for the end user defaults, in turn, from the end user's customer.

Tip
You can enter comments at other points in Call Maintenance.

Comments. This field always defaults to No. Specify Yes if you want to enter comments immediately. This is especially useful if you are taking information directly over the phone. Specify No if you do not want to enter comments at this point. When comments are updated, the system adds a line displaying the current date, time, and user ID.

When MTZ is active, comment date and time display relative to the user's time zone, if the user has defined a preferred time zone in Service/Support User Preferences.

Tip
If MTZ is active, call open date and time display relative to the end user's time zone.

Call Date, Time. These default to the current system date and time but can be changed during entry if you are recording a call taken earlier. The system uses the call open date in the search for valid coverage sources (warranty or contract), price lists, and service BOMs and routings.

End User Selection Frame

The End User Selection frame displays if you leave the end user for this call blank and press Go or Enter.

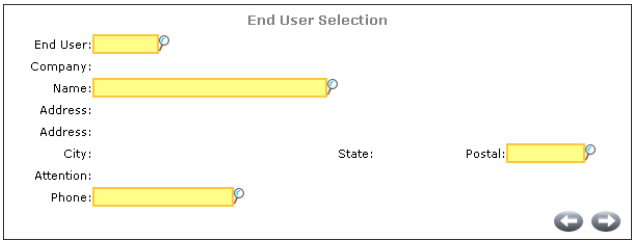


Fig. 11.16
End User Selection Frame

This frame assists you in selecting an end user based on four key pieces of information: number, contact name, zip code, and contact phone number. These data elements represent the kind of information that is often obtained directly from a caller on the phone.

Populate these fields in one of three ways: by direct input, by next/previous processing, or by lookup browses. When you enter a value, the system attempts to find an end user or end-user contact record that matches; otherwise, a warning displays.

When you press Go and the system finds a valid matching record, you are returned to Call Maintenance with that end-user number. If a matching record is not found, the system prompts you to create a new end user. The system carries over any values specified in the End User Selection frame to the next frame.

End User Frame

This frame displays when you answer Yes to create a new end user.

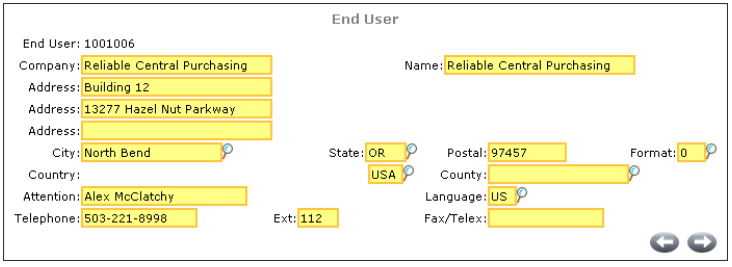


Fig. 11.17
End User Creation Frame

Tip
Change the temporary customer to a defined one if you know the customer related to the new end user.

By default, the new end user is associated with the temporary customer, as defined in Call Management Control. This enables you to define an end user without having to attach them to a valid customer. This is essential if you service items sold through distributors or retailers and end users contact your company directly for service.

See “End Users” on page 24.

The remaining fields on the frame specify basic end-user address information; specify further details about the end user in End User Address Maintenance. If you entered values on the End User Selection frame, they are carried over to the appropriate fields.

See page 133 for details.

If Multiple Time Zones is active, you are prompted to specify an end-user time zone, which defaults from the end user’s customer. The time zone determines how times are displayed and stored in Call Maintenance when you take a call for this end user.

Calls for End User Pop-Up

Tip
Open calls are not complete, canceled, or on hold.

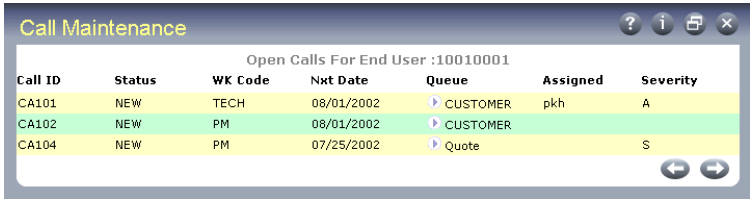
When you are creating a call for an end user with other open calls, you are prompted to display them. If you respond Yes, you are prompted to display call line item detail.

You can view calls at the call level or the line item level. The call level provides high-level information about the call; the line item level shows information related to the specific items on the call, such as part number and serial number.

In either window, select a call by pressing Enter. This replaces the call you were about to create with the one you select. This feature helps to prevent creating redundant calls in the system. If the call you are taking is about a different item, you can add it to the existing call.

The following lookup displays if you choose not to display call line-item detail. It displays call-level information.

Fig. 11.18
Open Calls For End User



Selecting a call from this lookup replaces the record you were about to create with the selected record. You can use the Pivot command to alternate the sort order of the display between queue and assigned engineer.

If you respond Yes to display call line item detail, a different view of the call information displays.

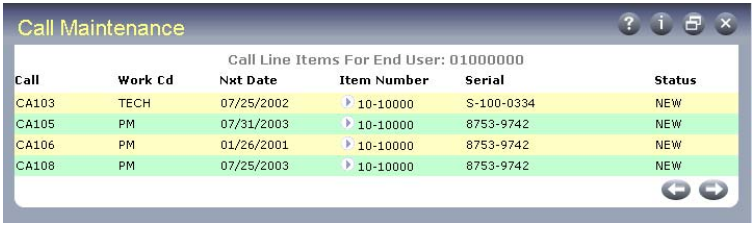


Fig. 11.19
Call Line Items For End User

Use Pivot to alternate the sort order of the display between item number and serial number.

Note If you have entered a serial number in the Call Maintenance header, the system shows you call lines for items with a serial number the same as or greater than the one you entered.

Call Defaults Pop-Up

When you enter a new call and call defaults have been defined with Call Default Maintenance, a pop-up displays between the first and second frame of Call Maintenance, as illustrated in Figure 11.20. Use this pop-up to specify the values to use in searching for the most appropriate call default record for this call.

See “Default Key Values” on page 359 for the system’s search order.

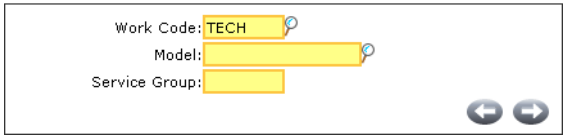


Fig. 11.20
Call Defaults Pop-Up

Work Code. When you create a call directly in Call Maintenance, the work code defaults from the technical work code as specified in Call Management Control. You can change this, but you must specify a work code.

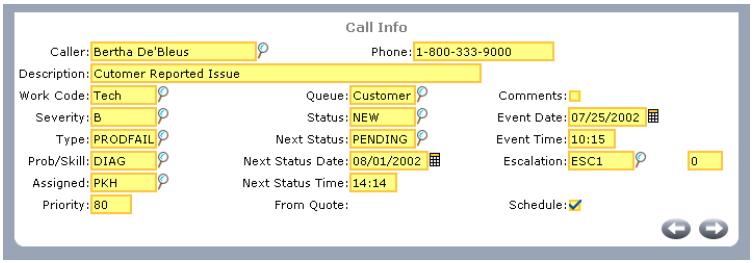
Model. If an item number has been specified in the call header, the system displays the item's model. For items in the installed base, the system reads this from the installed base record. For other items, it is determined from the value specified with Service Item Maintenance. Otherwise, it is blank.

Service Group. If an item number has been specified in the call header, the system displays the service group associated with the item in Service Item Maintenance. Otherwise, it is blank.

Call Info Frame

If you have created call defaults and performed other call setup activities, most of the fields in this frame already have default values.

Fig. 11.21
Call Info Frame



Caller. Defaults from the first Primary Contact associated with the end-user record, if one exists. If you created a new end user in the previous frame, Caller defaults from the Attention field.

Description. Brief description of the call. Description may default from Call Default Maintenance. This description appears on most reports and places where the call is referenced. For example, when you select a call in the Call Queue Manager, its description displays at the bottom of the screen.

Work Code. For a call you created directly in Call Maintenance, defaults from the technical work code specified in Call Management Control (11.24). The install work code is the default for system-generated installation calls, and the PM work code for system-generated preventive maintenance calls.

Severity. Severity indicates the end user's perception of how bad the problem is. May default from call defaults set up with Call Default Maintenance.

Tip
Set up values in Generalized Codes Maintenance (36.2.13) for the field ca_severity.

Type. Enter a type defined with Call Type Maintenance (11.1.21.4). Types provide an additional way to categorize calls in a user-defined way. If you are using call defaults, this field may default from Call Default Maintenance.

Problem/Skill. May default from Call Default Maintenance if you are using call defaults. Problem/Skill is an optional code with a dual purpose: it represents the kind of problem reported on a call and the kind of skill required to fix it. If you are using engineer scheduling, an engineer receives points if he or she has a skill that matches the call's problem.

Tip
Set up values in Generalized Codes Maintenance for field fsskill.

Assigned. Must be a valid engineer defined in Engineer Maintenance. If Assign Primary Engineer is Yes in Call Management Control, this field defaults from the primary engineer associated with the end user. You can enter another engineer or leave the field blank. A warning displays if the engineer specified has a non-available status.

The engineer specified in the Assigned field is considered the call engineer, and displays by default as the engineer for each new line added to the call. Assigning an engineer creates an engineer transaction record.

Yes in the Schedule field initiates the engineer scheduling sequence, which presents engineers available to service this call prioritized according to the points defined in Engineer Schedule Control.

If you assign an engineer in the call header and also select an engineer in the Availability frame, another engineer transaction record is created. This is true even if you select the same engineer again: two transaction records are created for the same engineer.

If you leave the Assigned field blank and select more than one engineer during scheduling, the system alphabetically assigns the first engineer to the call header.

The system uses information associated with the engineer when determining the call site, which can also affect the BOM and routing suggested by the system in the Item Service Structure Detail frame.

The engineer scheduling sequence in Call Maintenance considers only the engineer associated with the call header when calculating engineer load. If different engineers are specified for some line items, their availability is not affected.

Tip
Lower numbers indicate higher priority.

Priority. Enter a number to indicate how important this call is. In order of precedence, the value in the Priority field defaults from:

- The Call Priority field in End User Address Maintenance (if this is not zero)
- The Priority field in either Warranty Type Maintenance or Contract Type Maintenance.
- The priority of the Default Call Service Type defined in Contract Control
- The user's priority defined in Service/Support User Preferences

If an escalation is in effect, the system deducts the number of points in the Bump Priority field from the initial default value.

Queue. Enter the queue to which this call is assigned. Set up queues with Call Queue Maintenance (11.1.21.7). For a new call, this field defaults first from the escalation sequence in effect, then from Call Default Maintenance, then from any default set in Service/Support User Preferences, and finally from the queue specified as the Default Call Queue in Call Management Control.

Status. This field can be controlled through field security. Indicates the position of this call as it relates to the call's life cycle. Define call statuses with Call Status Maintenance (11.1.21.1). For a new call, status defaults first from Call Default Maintenance, then from the Open status set up in Call Management Control. Statuses are affected by the Escalation Monitor, if escalation is active.

Next Status. The status code that normally comes next, after the call completes the first status. The next status can default from Call Default Maintenance, or you can specify it when you create a status code. If escalation is active, the escalation sequence sets the next status and the system escalates calls to the next status within a specified time period.

Next Status Date, Time. The date and time the system next updates the call. The system calculates these fields in different ways, depending on whether escalations are being used:

- When call escalation is in effect, the system sets and updates the date and time according to the escalation sequence assigned to the call—the Days and Time Allowed in Status fields. This date calculation can be affected by Use Calendar Days in the Escalation in Escalation Control.
- Without call escalation, when you add a call the system bases the next status date and time on the response time and coverage days of the service type in effect.

See “Coverage and Call Dates/ Times” on page 375 for more detail.

You cannot leave Next Status Date blank if an engineer is assigned to the call, since the date is needed to update the engineer’s availability. This is true even when Schedule New Calls is No in Call Management Control.

The effect of the next status date and time depends on options in Call Maintenance:

- If you are using call scheduling, the next date and time determine when the scheduling sequence attempts to schedule an engineer. These fields determine the default start date and time in the Call Engineer Schedule Maintenance frame.
- If you are using escalations, the next date and time determine when the Escalation Monitor executes the next step in the escalation associated with the call. Each step in an escalation can change the call’s status, priority, queue, or notify key individuals about the call.
- If you are not using either of these options, this field is for reference; manually update and track it.

From Quote. Output-only reference field that has a value only if this call was created from a call quote.

Comments. Indicates whether a frame for recording call comments should display. The value in this field defaults from the Call Comments field in Call Management Control, unless comments already exist. In this case, Comments always defaults to Yes.

Event Date, Time. For a new call, the system sets these fields to the system date and time, then updates them along with the call record. If escalation is in effect, the system updates these fields when Escalation Monitor changes an aspect of the call.

Escalation. Enter a valid escalation code set up with Escalation Maintenance. Defaults, in order of priority, from the end user initiating the call, call defaults in effect, user preferences, or the Default Call Escalation field in Escalation Control.

Sequence Number. Represents the next sequence of this escalation to be run against this call by the Escalation Monitor. A sequence is a particular step in a call escalation. You can override the next sequence step to escalate the call rapidly.

Schedule. Defaults from Schedule New Calls in Call Management Control. If Yes, two frames for scheduling an engineer display: the Availability frame and the Call Engineer Schedule Maintenance frame. To use the scheduling feature of Call Maintenance, create and associate schedules with engineers in Engineer Maintenance. The Availability frame displays engineers in an order based on weighted values defined in Engineer Schedule Control.

Travel and Estimated Time Frame

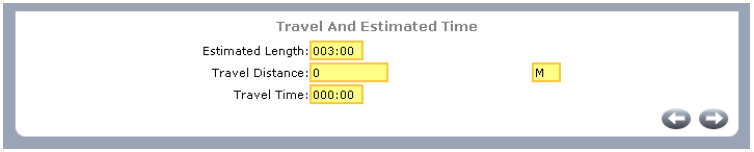
The Travel and Estimated Time frame appears only if Call Time Window is Yes in Call Management Control or if the user executing the procedure has set Call Time Window to Yes in Service/Support User Preferences (11.21.23).

If engineer scheduling is being used and Display by Calls is No in Engineer Schedule Control, the system uses the estimated length of the call to calculate engineer availability.

See page 143 for details.

Note Additional fields display if MTZ is active: Event Date and Time, Current Date and Time, and Current Time Zone.

Fig. 11.22 Travel and Estimated Time Frame



Estimated Length. Enter the call duration. Defaults first from call defaults, if you are using them, then from the various call lengths associated with different work codes in Call Management Control (11.1.24).

You can define five default call lengths in Call Management Control: one each for PM, Install, Update, and Corrective work codes and a general default that applies to the Technical work code and any others for which a default is not found. This enables you to estimate duration based on the kind of work being performed.

The value you specify for estimated length defaults into the Hours field of the Call Engineer Schedule Maintenance frame as the amount of time the engineer needs for this call. The system adds either the hours for an engineer or the number of calls to determine engineer load, which is used by engineer scheduling to assign points.

Travel Distance. Designates the distance from the support office to the end user; defaults from the value specified in End User Address Maintenance. If you include travel time as part of the call duration, you can adjust the estimate based on the travel distance.

Travel Unit of Measure (M, K). M indicates travel distances represent miles; K indicates kilometers. Defaults from the value specified in End User Address Maintenance (11.9.1), which in turn defaults from Call Management Control.

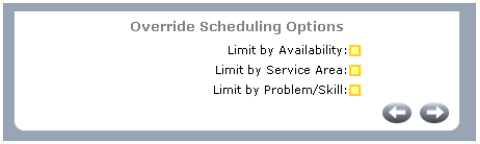
Travel Time. Designates the number of hours required to travel the distance between end-user installation and service office. Defaults from Travel Time in End User Address Maintenance. This field is for reference only and does not affect the estimated call length.

Tip
If you want the engineer scheduling function to take travel time into account, add it manually to the estimated time.

Override Scheduling Options

If you are using engineer scheduling and Override Scheduling Options is Yes in Engineer Schedule Control, a pop-up displays in Call Maintenance so you can modify the rules by which engineers are included or excluded from scheduling.

Fig. 11.23 Override Scheduling Options Pop-Up



See "Time Zones and Call Management" on page 142 for details.

Note Two additional options are available if MTZ is active.

Limit by Availability. Defaults from Engineer Schedule Control and indicates whether the system should consider for scheduling only engineers with an available status and available hours or calls on the date being examined.

Limit by Service Area. Defaults from Engineer Schedule Control and indicates whether the system should consider for scheduling only engineers with a service area that matches the area associated with the call.

Limit by Problem/Skill. Defaults from Engineer Schedule Control and indicates whether the system should consider for scheduling only engineers with a skill that matches the call problem.

Availability Frame

See Chapter 16, "Engineers and Scheduling," on page 563.

If the Schedule field is Yes for this call and you have completed the setup required for engineer scheduling, a pop-up window displays, where you can select one or more engineers.

You can assign more than one engineer to a call; however, only one is considered the call engineer. This is the engineer code that displays in the Assigned field in the call header. If you select multiple engineers for assignment and no one is currently assigned to the call, the engineer with the highest point score is considered the call engineer.

To calculate availability, the system follows these steps:

1. Determines which engineers to include based on their availability status and the limiting options selected.
2. Determines each engineer's total available hours or calls based on working schedules—detail, master, or on-call.
3. Determines how many hours or calls are assigned each day and subtracts them from the available hours or call load to calculate the engineer's final availability.

This window's appearance depends on Display by Calls in Engineer Schedule Control. In Figure 11.24, Display by Calls is Yes.

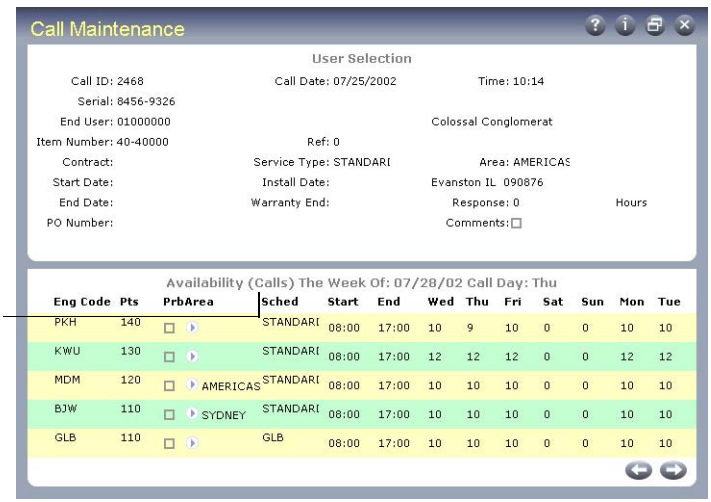

Call Maintenance
User Selection
Call ID: 2468
Call Date: 07/25/2002
Time: 10:14
Serial: 8456-9326
End User: 01000000
Colossal Conglomerat
Item Number: 40-40000
Ref: 0
Contract:
Service Type: STANDARI
Area: AMERICAS
Start Date:
Install Date:
Evanston IL 090876
End Date:
Warranty End:
Response: 0
Hours
PO Number:
Comments:
Availability (Calls) The Week Of: 07/28/02 Call Day: Thu
Eng Code Pts PrbArea Sched Start End Wed Thu Fri Sat Sun Mon Tue
PKH 140 STANDARI 08:00 17:00 10 9 10 0 0 10 10
KWU 130 STANDARI 08:00 17:00 12 12 12 0 0 12 12
MDM 120 AMERICAS STANDARI 08:00 17:00 10 10 10 0 0 10 10
BJW 110 SYDNEY STANDARI 08:00 17:00 10 10 10 0 0 10 10
GLB 110 GLB 08:00 17:00 10 10 10 0 0 10 10
Indicates Display by Calls is Yes.

Fig. 11.24
Call Maintenance Scheduling

The system initially displays available engineers prioritized by point totals. Use Pivot to sort the display by area.

The availability frame shows:

- The total number of scheduling points assigned to the engineer. The system calculates points based on the values in Engineer Schedule Control for area, problem, availability, primary engineer, and time zone (when MTZ is active).
- Whether the engineer's skill matches the problem (Prb = Yes).
- The engineer's area.

Tip
Engineer points are used only to recommend engineers for a call; you can still select any one you want.

Tip
If MTZ is active, the engineer's time zone displays rather than the schedule.

- The work schedule for the engineer, used to calculate availability.
- The time of day the engineer is scheduled to start and stop working on the call's next status date.
- The number of unconsumed hours or calls for the engineer for the day before and two days after the next status date.

An asterisk (*) under a day of the week indicates the engineer is not available, and two plus signs (++) indicate the engineer is available as a result of an on-call schedule.

Note When engineers are scheduled, the system uses an infinite schedule. This means the system does not prevent you from scheduling more than 24 hours in a day or more than the engineer's call load allows. When this happens, the availability points display as a negative quantity.

Select the engineer you want to assign to the call. An asterisk appears to the left of the selected engineer. You can select more than one engineer to assign to each call line.

If an engineer is entered in the Assigned field on the call header, it is not necessary to select the engineer again. Select an engineer if you want more than one engineer assigned to the call. Selecting the same engineer again creates two transactions for the engineer, doubling the individual's load, which is probably not what you want.

Call Engineer Schedule Maintenance Frame

If Schedule is Yes and you select an engineer, the Call Engineer Schedule Maintenance frame displays.

See Chapter 16, "Engineers and Scheduling," on page 563 for details.

Use this frame to edit the default scheduling information for this engineer. It is similar to the frame displayed in Engineer Assignment Maint (11.13.15.8), where you can modify the same data. Multiple transactions can exist for one engineer. Use the Next/Previous keys to display all the transactions.

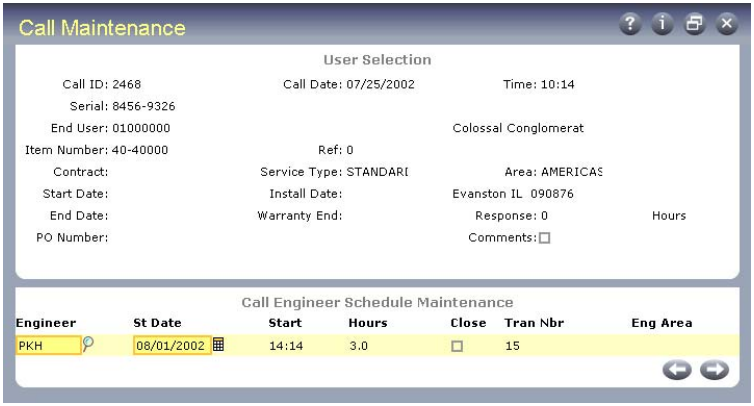


Fig. 11.25
Call Engineer Schedule Maintenance Frame

Note When MTZ is active, the system enters the scheduled start date and time in the end user's time zone, which displays in the Call Maintenance header frame.

St Date. Defaults from Next Status Date on the call header, but can be modified. If only one engineer transaction exists for a call, updating this field also updates the call's Next Status Date value.

Start. Defaults from Next Status Time on the call header, but can be modified. If only one engineer transaction exists for a call, updating this field also updates the call's Next Status Time value.

Hours. The estimated number of hours required for this engineer to complete the call. Defaults from the Estimated Length field. If only one engineer transaction exists for a call, updating this field also updates the call's estimated length.

Close, Tran Nbr. Output-only field of the call transaction number and a Yes/No field indicating if this call transaction number has been closed.

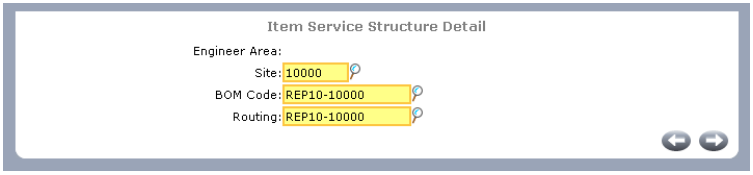
Eng Area. Displays the service area associated with the engineer.

Tip
If MTZ is active, this column is replaced by engineer time zone.

Item Service Structure Detail Frame

This frame displays only if Call Structure Window is Yes in Call Management Control or if the user executing the procedure has set Call Structure Window to Yes in Service/Support User Preferences (11.21.23).

Fig. 11.26
Item Service Structure Detail Frame



Engineer Area. Output-only field that displays the assigned engineer's area. If no engineer is assigned, this field is blank.

Site. Indicates the inventory site where repair parts for the item being serviced reside. Call Activity Recording uses the site when parts are issued in the repair of this item. This field cannot be modified once you open reports for this item in CAR. The site associated with the first call item determines the value for the call site on the CAR header.

The system follows a sequence to derive a default site, beginning with an engineer. If an engineer is not assigned in Call Maintenance, the sequence begins with the third step.

- The key site and location the system uses is the one associated with the assigned engineer in Engineer Maintenance (11.13.1). If you leave the engineer site blank and specify a location, the system uses the area site, but the engineer location takes precedence over the area location.
- If the engineer does not have a site or location, the system uses the ones associated with the engineer's area in Area Maintenance (11.15.1).
- If these values are all blank, the system uses the default spares site/location set up in Default Site Maintenance (11.21.13).
- If a site has still not been found, the system uses the site and location defined when the item was set up in Item Master Maintenance (1.4.1).

- If a site has still not been found, the system uses the site associated with the end user's customer in Customer Maintenance (2.1.1).

BOM Code. Must be a valid service BOM set up with Service Structure Maintenance. It defaults from the BOM code for the current work code associated with the item in Service Item by Site Maintenance (11.3.9) first. If no BOM is specified for the site, the system looks for a BOM set up with Service Item Maintenance. For the PM work code, the system uses the PM BOM code; for the install work code, the system uses the install BOM; otherwise, the repair BOM code is the default.

This BOM prints on the call to assist the engineer in servicing the item. It also defaults into CAR and can be auto-loaded into the item usage frames of CAR. This field cannot be modified once you open reports for this item in CAR.

Routing. Must be a valid service routing set up with Service Routing Maintenance. It defaults from the routing associated with the item in Service Item by Site Maintenance (11.3.9) first. If no routing is specified for the site, the system looks for a routing associated with the item in Service Item Maintenance. For the PM work code, the system uses the PM routing; for the install work code, the system uses the install routing; otherwise, the repair routing is the default.

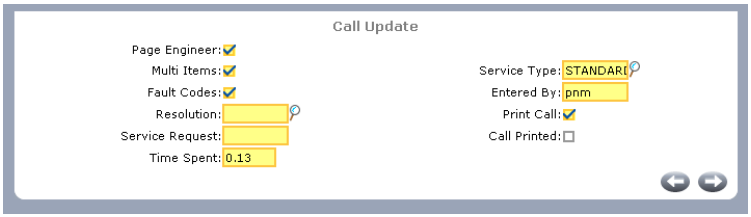
This routing prints on the call to assist the engineer in servicing the item. It also defaults into CAR and can be auto-loaded into the labor/expense and item usage frames of CAR. This field cannot be modified once you open reports for this item in CAR.

Note When a call is referenced on an RMA and you release the RMA to a work order, the system uses the repair routing defined in Service Item Maintenance or Service Item by Site Maintenance on the rework work order, even if you specified a different routing on the call.

Call Update Frame

The Call Update frame always displays.

Fig. 11.27
Call Update Frame



Page Engineer. Indicates if the Engineer Paging frame should display to initiate paging. This field defaults to Yes for a new call if three conditions are true:

- An engineer has been assigned to the call.
- The Dispatcher field in Call Management Control is Yes.
- The selected engineer is a field engineer in Engineer Maintenance.

Multi-Items. Indicates whether the Call Items frame should display. Set this field to Yes if problems for more than one item are being reported on this call, or if you want to view the detail for the first item specified on the call header.

Tip
To standardize usage, set up values for these codes in Generalized Codes Maintenance.

Fault Codes. Defaults from Use Fault Code in Call Management Control. Setting Fault Codes to Yes displays a frame where you can enter various fault, problem, cause, and resolved codes for the first line item on the call. The title of the Fault Code frame displays as `Fault Codes for Call Line x`, so it is clear which line the codes are associated with.

Tip
Set up values with Generalized Codes Maintenance for the field *ca_resolve*.

Resolution. An optional code you define that identifies how the problem is going to be resolved. When you enter a service call, the resolution code may be blank, indicating the call is not resolved. The resolution code is normally filled in later, once the call is resolved or forwarded.

Resolution codes can indicate the type of solution, such as the adjustment or repair that was made, or they can indicate how the call was forwarded, such as the entry of an RMA or service request. The call resolution is typically more generic than the resolution codes in the Fault Codes pop-up.

Service Request. Validated against service requests created with Service Request Maintenance. If you associate a service request with a call when you create it, the SR number displays by default. Since multiple calls can reference the same SR, you can also manually enter an SR number.

See Chapter 18, “Service Requests,” on page 601.

Time Spent. The amount of time spent on this service call. Calculating time can be important to service organizations that bill for telephone support time rather than on-site services.

The system can calculate the time spent. If Total Call Time in Call Management Control is Yes, the system tracks the elapsed time in decimal hours from the time you enter the Call Info frame. It stops when you reach the Call Update frame.

If additional time is taken after this, manually increase the time spent. Each time you access a call in Call Maintenance, the system adds any additional time spent to the current total time.

When this field is No, the time spent defaults to zero and must be entered manually.

Service Type. Defaults from the warranty or contract type defined in the call header. While you can modify the service type currently in effect, attributes determined by the previous service type are not changed, including response time, priority, and coverage days. The system considers the limits associated with the new service type, however, in Call Activity Recording. This field cannot be modified once you open a report for the first item in Call Activity Recording.

Tip
Set field security on on this field if you do not want the default service type modified.

Entered By. A system-maintained field to record the user ID of the person who entered this service call. For reference only.

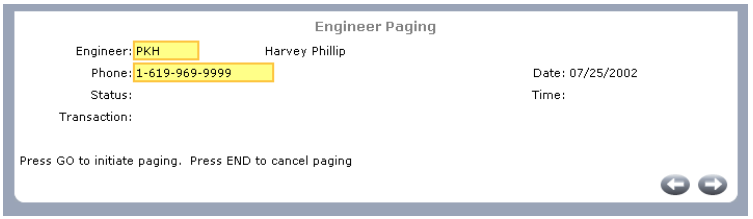
Print Call. If Yes, the system prompts you to enter an output device so the call can be printed directly from Call Maintenance.

Call Printed. This is an output-only field maintained by the system. For a new call, this is always No. When you print a call, the system sets it to Yes. This field is for reference only; it does not restrict the reprinting of the call.

Engineer Paging Frame

If Page Engineer is Yes, the Engineer Paging frame displays.

Fig. 11.28
Engineer Paging Frame



Engineer. The code identifying the engineer assigned to the call displays by default. The employee name of this engineer displays next to the code.

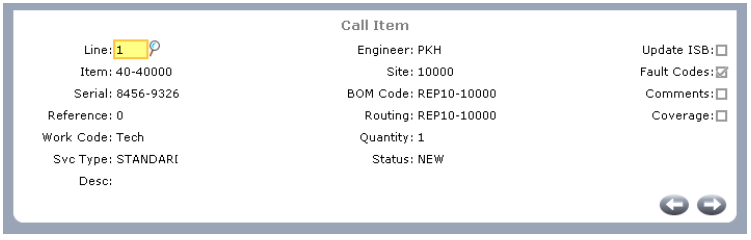
Phone. If the engineer being paged has been set up with a pager number in Engineer Maintenance, it displays in this field. This is the number the system passes to the paging program.

Date and Time are display only. When you press Go, the system initiates paging. Set up the paging program and paging statuses in Paging Control (11.11.24).

Call Item Frame

If Multi-Items is Yes, the Call Item frame displays so you can update information for each line item.

Fig. 11.29
Call Item Frame



Call Line. The line number associated with this item on the call.

Item, Serial, Reference. Uniquely identifies the item being repaired. The reference is the ISB reference number. These fields cannot be updated once you open a report for the item in Call Activity Recording.

Work Code, Engineer, Site. These fields default from the call header, but can be changed for each line item. If this is a new line and you change the engineer, the default site is recalculated based on information for this engineer. Once the record is created, changing the engineer does not change the site.

Svc Type. The system calculates this field based on the item entered. If the item is currently covered by a contract or warranty, the associated service type displays by default. Otherwise, the system uses the default call service type from Call Management Control. This field cannot be updated once you open a report for the item in Call Activity Recording.

BOM Code, Routing. These default from the BOM codes and routings defined first for the item in Service Item by Site Maintenance, then in Service Item Maintenance, based on the work code specified.

Quantity. For an item not in the installed base, quantity defaults to one, but can be modified. If the item added to the call already exists in the installed base, its ISB quantity displays by default. This field cannot be updated once an open report exists for this call line in Call Activity Recording.

Status. This field can be security protected. Displays the current status of the call line. The call line status is important in Call Activity Recording and determines whether the detail recorded for the line should be included on the call invoice.

Normally, the system sets the line status in CAR. The status is available in Call Maintenance to give you added flexibility and control. Each line on a call can have a different status. For example, you can cancel one line found to be unnecessary, while leaving other lines open.

Update ISB. Use this field to decide for each line item on the call if the system should add it to the installed base, overriding other settings. It defaults to Yes when:

- The item is already in the installed base. In this case, Update ISB defaults to Yes regardless of other settings.
- The Installed Base field in Service Item Maintenance is Yes for the item, *and* the Create ISB field is Yes for the current end user in End User Address Maintenance.

Tip
The value of Create ISB for a new end user defaults from the Create ISB field in End User Control.

- The item is not defined in the item master, but Create ISB is set to Yes for the current end user in End User Address Maintenance.

If the item has been set up in the Item Master as serial or lot-number controlled and a number is not specified, the system sets Update ISB to No and it cannot be changed. Lot and serial-controlled items must be added to the installed base with an appropriate number. If the Item field is blank, Update ISB also defaults to No.

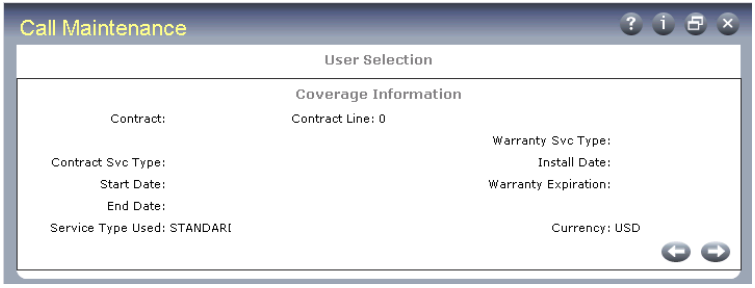
Fault Codes, Comments. These fields are the same as the comparable fields for the first call line in the Call Update frame.

Coverage. Defaults from Coverage Window in Call Management Control. If Coverage is Yes, the following frame displays coverage information.

Coverage Information Frame

When you create a call, the coverage information for the first item displays in the call header. However, each item on a call can be covered by a different contract or warranty. The Coverage Information frame shows detailed information for any line on the call.

Fig. 11.30 Coverage Information Frame



See “Levels and Limits of Service” on page 170 for details.

The system uses the call open date to search for effective limits. These limits may be derived from a contract, service type, or warranty, as indicated in the header of the frame. The system also displays the currency associated with the call line.

If service coverage limits are derived from a contract, the system includes the amount consumed against the limits in the display.

Fault Codes Pop-Up

If Fault Codes is Yes, a pop-up window for recording codes displays as illustrated in Figure 11.31. Fault codes are tied to a particular line, as indicated by the heading of the pop-up window. You typically enter fault codes after work on the call is complete and specific data is available regarding the problem and resolution. You can use this data for generating custom call reports.

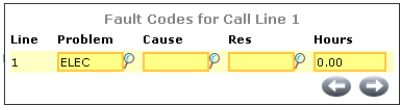


Fig. 11.31 Fault Codes Pop-Up

Line. You can enter more than one line of information. The system increments the line number.

Problem. Set up problem codes in Generalized Codes Maintenance for field ccd_problem. These codes are generally more specific than the call problem on the call header.

Cause. Set up cause codes in Generalized Codes Maintenance for field ccd_cause. Use these codes to categorize the source of the problems reported on calls.

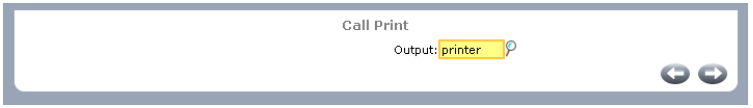
Resolved. Set up resolution codes in Generalized Codes Maintenance for field ccd_resolution. Use these codes to categorize the solution applied to the reported problem. These codes are typically more specific than those specified for the Resolution field of the Call Update frame.

Hours. Indicates the number of hours spent working on the resolution to the problem recorded on this line. The engineer scheduling sequence does not consider this figure, but it can be important in statistical reporting, especially if one engineer visit addresses multiple problems.

Call Print

If Print Call is Yes, the system prompts you to enter an output device.

Fig. 11.32
Call Print Frame

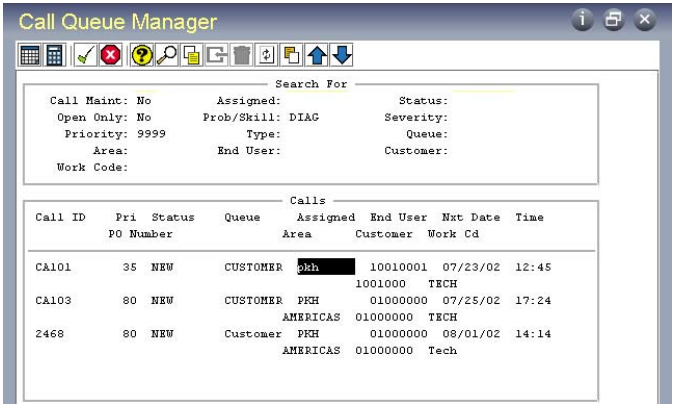


When you print from Call Maintenance, the system includes any BOMs and routings associated with the item in the output.

Call Queue Manager

The Call Queue Manager (11.1.6) is a multipurpose tool for sorting and manipulating call records. In busy support environments, you usually need to view and edit calls according to preselected criteria. For example, a supervisor may scan calls by status, service engineer, or priority.

Fig. 11.33
Call Queue Manager (11.1.6)



You can specify any number of search criteria for reviewing calls.

Note Selecting calls by work code can take noticeably longer than other selection criteria. Keep this in mind when displaying a large number of calls.

See “Displaying Call Information” on page 146 for more information.

When Multiple Time Zones is active, you can select a display time zone to use when reviewing calls. The next status date and time of each call display relative to the time zone selected.

Display Order

The Queue Manager setting in Call Management Control determines how the Call Queue Manager (11.1.6) sorts and displays calls. An individual user can override this value with a preference set in Service/Support User Preferences (11.21.23).

Values can be 0 (zero) through 3, and each has a different effect on primary and secondary sort orders:

0 (zero): Displays calls by next date and time. Pivot sorts by end user.

1: Groups calls by assigned engineer, then priority. Pivot sorts by queue.

2: Sorts by the assigned engineer. Pivot sorts by end user.

3: Sorts by area. Pivot sorts by customer.

When you enter the Call Queue Manager, the system displays an informational message describing the sort method currently in use.

Maximizing Display Area

Because of window size restrictions, information for four calls displays at one time—five calls in the Windows interface. Before calls are displayed, you are prompted to retain visibility of the search criteria. If you respond No, the screen clears before displaying calls. The display area is optimized so that an additional three calls can be included—a total of seven in character and eight in Windows.

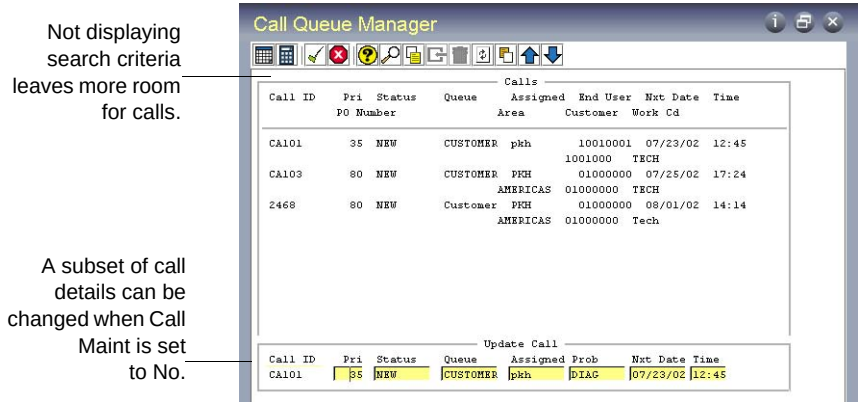
Editing Calls

You can edit call records directly from the Call Queue Manager in two ways, depending on the Call Maint field.

Call Maint is No

Review the list of calls displayed on the window. Press Enter while your cursor is positioned on a call to update call detail.

Fig. 11.34
Updating a Call in the Queue Manager


Not displaying search criteria leaves more room for calls.
A subset of call details can be changed when Call Maint is set to No.
Call Queue Manager
Calls
Call ID Pri Status Queue Assigned End User Nxt Date Time
PO Number Area Customer Work Cd
CA101 35 NEW CUSTOMER pkh 10010001 07/23/02 12:45
1001000 TECH
CA103 80 NEW CUSTOMER PKH 01000000 07/25/02 17:24
AMERICAS 01000000 TECH
2468 80 NEW Customer PKH 01000000 08/01/02 14:14
AMERICAS 01000000 Tech
Update Call
Call ID Pri Status Queue Assigned Prob Nxt Date Time
CA101 35 NEW CUSTOMER pkh DIAG 07/23/02 12:45

Tip
A call dispatcher is responsible for monitoring calls.

From this frame, you can change call priority, status, queue, assigned engineer, problem code, and next date and time. A call dispatcher can use this feature to redirect the calls and assign them to appropriate engineers.

Note In Figure 11.34, the search criteria are not displayed, so that more calls are displayed.

Call Maint is Yes

With this setting, pressing Enter on a call in the list takes you directly to Call Maintenance, providing full call editing functionality. This setting is best suited to service engineers who must perform detailed editing of their calls.

The display in the Call Queue Manager is updated automatically, using the time interval in Queue Manager Pause in Call Management Control (11.1.24).

Displaying Calls by Next Date and Time

You can set up the Call Queue Manager to display calls in the order of next status date and time (Queue Manager is 0). When set up this way, the Queue Manager displays the call with the oldest next status date and time first. In this manner, you can view all overdue calls or calls about to become overdue. If you run Call Queue Manager by next status date and time, you can also view all the open calls for a particular engineer ordered by oldest open call first.

Call Generator

You can use Call Generator (11.1.8) to generate three types of calls:

- The next scheduled call on contract preventive maintenance schedules
- Calls for a range of items in the installed base
- Calls related to field notifications

Input Source in the initial Call Generator frame determines the kind of call generated.

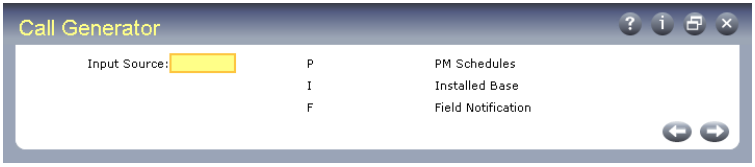


Fig. 11.35
Call Generator Initial Frame (11.1.8)

This section discusses generating calls for PM schedules and installed base items. The chapter on the installed base discusses generating calls for field notifications.

See “Field Notification” on page 66.

You can also use the Call Generator to generate PM calls for items in the installed base, apart from a PM schedule—internal maintenance schedules for your own equipment, for example. Or, you can use it to generate calls to remind end users without contracts that equipment is due for PM, thus generating extra service revenue.

Important This utility can generate a large number of calls at one time. If you run it by mistake, it may take some time to eliminate the unneeded calls. Menu-level security is recommended.

Tip
When generating calls, consider running the program in batch.

Generating PM Calls

If Create PM Calls is No in Contract Control, the system creates preventive maintenance schedules, but does not actually generate calls. Instead of going through the Contract Maintenance sequence again, generate the calls using the Call Generator

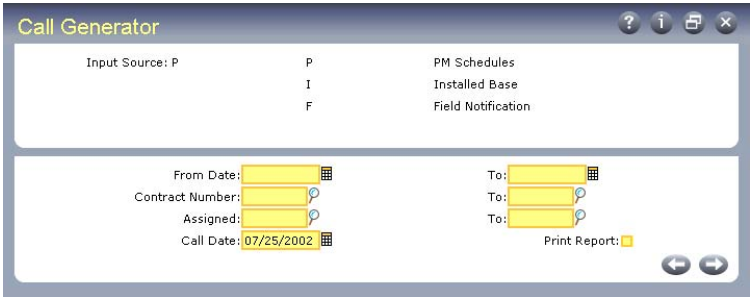
Other reasons may influence you to create PM calls with the Call Generator rather than with Contract Maintenance. The Call Generator offers more control over the calls, since you can specify a call open date. This is important because the system searches for valid coverage limits based on the call open date.

See “Using the Call Generator” on page 343.

The Call Generator also enables you to keep the number of open calls to a minimum, since calls need not be created until near the time service is due. These issues are discussed in more detail in Chapter 10.

Figure 11.36 illustrates the Call Generator when Input Source is P.

Fig. 11.36
Call Generator for PM Calls



You can generate calls based on a range of schedule dates, a range of contract numbers, and a range of assigned engineers.

When Create PM Calls is Yes in Contract Control, the system creates only the first call on a PM schedule. In the call generator, one call is created for each scheduled date within the date selection range. If your date range is wide, more than one call may be created for a particular schedule.

Example A item on a contract has a visit scheduled every 30 days, starting on 01/01/02. You execute the Call Generator with a date range of 01/01/02–03/01/02. Three calls are generated for this item.

Tip
To execute the program in batch, specify Yes to Print Report.

You can generate a report listing the calls created during the execution of the Call Generator. If you choose not to generate a report, a message displays when the program completes, indicating the number of calls created and the range of call numbers.

Generating Installed Base Calls

You can also use the Call Generator for items in the installed base. Use this feature to meet many needs relative to installed base updates that do not require the additional level of control provided with field notifications.

When creating calls for installed base items, specify a work code. The system uses appropriate defaults set up with Call Default Maintenance, if available. If you specify the PM work code, one field of the item selection criteria changes. Instead of selecting installed base items based on ship date, you can select items based on their last PM date.

You can also combine calls for items in the installed base, so the items for one end user are put on one call. Only one currency can be used on the call.

See “Call Currency” on page 373.

Items in the installed base may include a product structure beneath them. To limit calls to parent items only, set Top Level Only to Yes.

Figure 11.37 illustrates the Call Generator when Input Source is I.

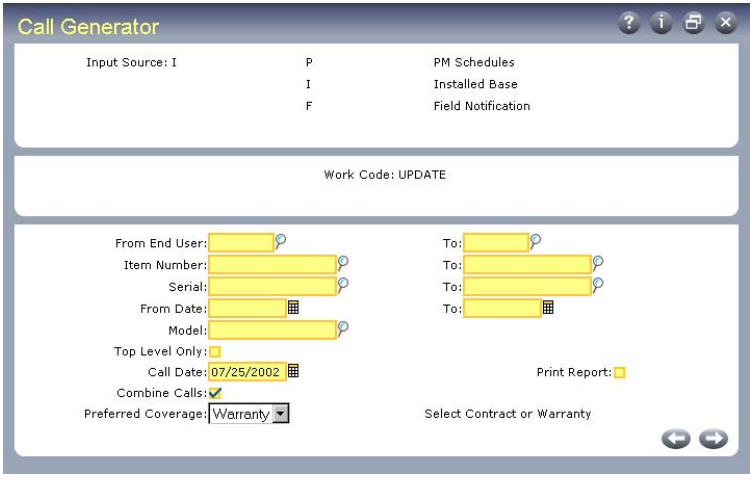


Fig. 11.37
Call Generator for Installed Base Calls

Work Code. The default is blank. Enter any valid work code defined with Work Code Maintenance. The system uses the work code specified for calls generated and finds call defaults created in Call Default Maintenance.

From End User, To. This field can be blank. If it is not, the system creates calls only for end users within the range.

Item Number, To. This field can be left blank. If it is not, the system creates calls only for installed base items with numbers within the range.

Serial, To. This field can be blank. If it is not, the system creates calls only for installed base items with serial numbers within the range.

From Date, To. This field can be blank. If it is not, the system creates calls only for item numbers with a date within the specified range. Select items on PM schedules based on a range of last PM dates. Select items in the installed base based on a range of ship dates.

Model. If you are tracking installed base items by model number, enter a model number in this field to include only items with this model in the calls generated.

Top Level Only. Set to Yes to create call lines only for parent items. Set to No to create call lines for each item in the installed base configuration.

Call Date. Defaults from the system date, but can be modified. Specifying an open date for calls generated during this execution of the Call Generator gives you more control over when the system begins processing the calls. This can be especially significant if you use effective dates on coverage limits, since the system uses the call open date when determining coverage terms that apply to an item.

Combine Calls. Specify Yes to generate one call for each end user. The system creates multiple lines for each installed base item for this end user. Specify No to create one call for each installed base item.

Preferred Coverage (Warranty/Contract). The system uses this value if overlapping coverage exists for an installed base item.

Tip
Set to Yes to run in batch.

Print Report. Indicates whether the system should generate a printed report listing the calls created. If Yes, you are prompted for an output device for the report and Batch ID. If No, a report is not generated, but a message does display when execution completes indicating the number of calls created and the range of call numbers.

Call Status Changes

You can define any number of call statuses, representing various stages in the call life cycle. You can move a call from one status to any other, unless the status is the Complete, Closed, Hold, or Cancel status defined in Call Management Control.

In these four cases, the system checks to ensure that the status change is valid. Many of these validations are related to the kind of transactions that have taken place in Call Activity Recording. Table 11.5 summarizes the validations the system makes when completing, closing, or canceling a call. The following sections provide more detail.

Table 11.5 Requirements for Call Status Changes

	Complete	Close	Cancel
No reports	Error	OK	OK
No invoiceable or invoiced detail	Error	OK	N/A
Reports exist	OK	OK	Error
Open MO	OK	Error	Error
Temporary Customer (Call Activity with Temp is No)	Error	Error	OK
Temporary Customer (Call Activity with Temp is Yes)	OK	OK	OK
Reports on Hold (call line)	OK	Error	N/A
Reports on Hold (call)	Error	Error	N/A
Status of line is not closed, complete, or canceled	Error	Error	N/A
Invoiceable report has unprocessed transactions	Error	Error	N/A

Completing a Call

The complete status indicates a call is ready for invoicing, or a report has been invoiced. Since recording activity in Call Activity Recording is a preparation for invoicing, the system always attempts to set the call line and call status to complete, unless Close on Recording is Yes in Call Management Control. In this case, the system attempts to close the lines and the call first. If this does not succeed, then the system attempts to

complete it. If that fails, the line and call statuses are unchanged, with one exception. If the line was previously complete or closed, the system sets it to the open status.

Requirements to Complete a Call Line

The system makes a number of checks before a call can be completed, at three different levels: call, call line, and line reports. If it encounters any errors when trying to complete lines, it displays a message.

The status of lines that cannot be completed is unchanged, unless they were previously closed or completed. This could happen if you added more detail to a previously complete line. In this case, they are reset to the open status. If you try to change the line status to complete, the system produces more precise error messages.

Existence of a Report

Since completing a call line is preparation for invoicing and valid afterward, at least one report must exist with an invoiceable or closed status and fully processed detail, or a message displays.

Call Status

To complete a line, the current status of the call cannot be closed, canceled, or hold. If it is, a message displays.

Open MOs

The system warns the user if open MOs are attached to the call or call line. This is only an error when the status is closed. The call cannot be closed until all quantities on the MO are either consumed or returned.

Temporary Customer

If the call was created for the temporary customer specified in Call Management Control, Call Activity with Temp must also be Yes in the control program. Otherwise, an error is generated. This error does not occur under normal circumstances, since if Call Activity with Temp is No, you should not be able to access the call in Call Activity Recording to create a report.

Requirements to Complete a Call

The requirements to complete a call are more stringent than to complete a line, since all call lines must be either closed, complete, or canceled. To complete a line, the system verifies that at least one invoiceable report exists. To complete the call, however, the system verifies that all reports associated with a complete line are either closed or invoiceable with fully processed detail. If a call cannot be completed, a message displays in the Call Status frame of CAR.

If you attempt to manually change the call status to complete, the system generates more exact errors listing line numbers with open reports.

Open MOs

The system warns the user if open MOs are attached to the call or call line. This is only an error when the status is set to closed. The call cannot be closed until all quantities on the MO are either consumed or returned.

Line Status

To complete the call, all lines must be closed, completed, or canceled, or a message displays.

Existence of a Report

Since completing a call is preparation for invoicing, at least one report must exist with an invoiceable status and fully processed detail. If the call has since been invoiced, the complete status is still valid if closed reports exist. However, if you have canceled the lines on the call, you cannot set the call status to complete; you must close or cancel it.

If you are finished with a call without recording activity, you must close it, but not complete it. Warning messages display if the system cannot complete the call or line.

Report Status

Two checks are made on the status of reports created for the call in Call Activity Recording. If a report exists, but has no transaction detail, you must close it before the call can be completed or a message displays.

If you create reports in CAR and record transaction detail, the report status must be invoiceable or closed. The system sets the report status to H (hold) if it encounters any errors while issuing inventory. A call with a report on hold cannot be completed.

Closing a Call

A call is closed when its status is set to the Close Status in Call Management Control. This status is the final status of a call and indicates service activity for this call is finished and ready for invoicing. Once a call is closed, you can record no more activity. However, you can reopen closed calls by changing their status.

If you take calls for items that are not in the installed base, the system creates an installed base record when the status of the call is set to closed. Normally, however, if any activity has been recorded for the call, the installed base record is created in Call Activity Recording. You can also move closed calls that are fully invoiced to history and then archive and remove them from the system.

Close calls from the following functions:

- Call Maintenance
- Call Activity Recording
- Call Queue Manager
- Engineer Assignment Maintenance

With slight variations, each program makes similar verification and produces similar effects. You cannot use escalation sequences to close calls automatically.

Effects of Closing a Call

The system takes a number of actions when a call is closed.

- If the call is for an item that is not yet in the installed base and no activity is recorded in Call Activity Recording, the system can create an ISB record when the call is closed. You can decide per line item which items to add to the installed base. If activity is recorded, the ISB record is created in CAR, rather than at call closure.
- Engineer transactions for the call are closed.

- If the call was generated as part of the PM scheduling sequence in Contract Maintenance and Create PM Calls is Yes in Contract Control, the system generates a new PM call. It is scheduled for the next open date on the contract's PM schedule.
- If the install work code is associated with the call, the system sets the installation date, next PM date, warranty duration, and warranty expiration based on the call closure date and time.
- The system clears the call next status field, as well as the next status date and time, since no more activity is expected for this call. In addition, the call close date and time are set.

Differences Between Complete and Closed

Both complete and closed can mean you are done with a call except for creating the invoice. Complete is much less final than closed. You can close a call with no intention of creating an invoice. However, to be complete, invoiced or invoiceable reports must exist on the call. Some other differences include:

- MOs can be open for a complete call, but not for a closed call.
- Closed calls can be archived and deleted.

Requirements to Close a Call

The system makes checks at three levels before a call can be closed: call, call line, and line reports. When the system detects an error, it stops checking and displays the error. If possible, it also displays the source of the error by indicating the line number or the report number that did not pass verification.

Note A call can be either closed or canceled if no activity has been recorded. How you want to use these two statuses is up to you.

Multiple Engineers

If more than one engineer has been assigned to the call, it cannot be closed from Engineer Assignment Maintenance. This restriction prevents one engineer from updating the call status when another engineer is not finished.

Open MOs

No open MOs can be attached to the call. If an MO was associated with the call, the call cannot be closed until all quantities on the MO are either consumed or returned.

Temporary Customer

If the call was created against the temporary customer specified in Call Management Control, Call Activity with Temp must also be Yes in the control program.

Line Status

Each line item on the call with reports must have a status of closed, complete, or canceled, or a message displays. You can still close a call directly from Call Maintenance if you have not recorded any activity against it.

Report Status

Two checks are made on the status of reports created for the call in Call Activity Recording.

- If a report has been created but has no transaction detail, you must manually close it before the call can be closed. Otherwise, the system assumes this report still needs to be invoiced and generates an error if you attempt to move the call to history.
- If you create reports in CAR and add transaction detail to them, the status of the report must be invoiceable or closed or a message displays. The system sets the report status to H (hold) if it encounters any errors while issuing inventory. A call with a report on hold cannot be closed.

Report Transactions

If detail has been recorded in Call Activity Recording, the system verifies that all inventory has been successfully issued. It also verifies that all labor and expense transactions have been posted to the proper GL accounts. If not, a message displays.

Moving Calls to History

Maintain complete call history online by moving closed and canceled calls to a separate history table. While closed calls no longer appear in the Call Queue Manager unless you specifically request them, they do appear on call browses, inquiries, and reports until you move them to history. Moving them to history can reduce the number of records you need to review to find calls being worked on.

You can review, but not modify or invoice, data related to calls in the history table with Call Print with History Report (11.1.1.5).

Select calls to be moved by range of call ID, by range of end user associated with the call, or by the close date. You can move only closed calls, only canceled calls, or both closed and canceled calls matching the other criteria by changing the Move Closed and Move Canceled field values.

You can also produce a report of calls that would be affected by setting both Move fields to No and both Audit fields to Yes. The report is generated to the specified output device.

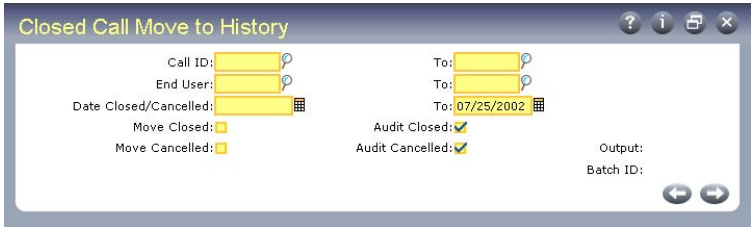


Fig. 11.38
Closed Call Move to History (11.1.1.21)

Executing Closed Call Move to History (11.1.1.21) copies closed or canceled calls within the specified date range from the call master (`ca_mstr`) table to the call history (`chm_mstr`) table, then deletes the call from the call master. You can keep or delete and archive this history with Call/Quote History Delete/Archive (11.1.1.23).

Tip
Canceling a call sets the close date in the same way closing it does.

Canceling a Call

A call can be canceled only if no activity has been recorded for it. The cancel status is an important metric tool. Many times customers call in a panic and log a call. When they have calmed down, they realize the source of the problem and call back to cancel the call.

Tip
You can move canceled calls to history and archive/ delete just like closed calls.

Tracking the number of canceled calls can be useful in determining if there is an educational problem with users at a site. It may support an opportunity to do some marketing for training revenue or update products so they are more user friendly.

Effects of Canceling a Call

Canceling a call has many of the same effects that closing a call does.

- If all the conditions are met, the system prompts you to add an item to the installed base when a call is canceled. This is so you can record that this end user has the item, even though the reported issue turns out to be invalid.
- The system closes the engineer transactions for the call if more than one engineer was assigned to it. Any estimated hours calculated as part of the engineer's work load for engineer scheduling purposes are removed.
- If the call was generated as part of the PM scheduling sequence in Contract Maintenance, the system generates a new PM call and schedules it for the next open date on the contract's PM schedule.
- The system clears the call's Next Status field, the Next Status Date, and the Next Status Time, since no more activity is expected for this call. In addition, the call close date and time are set.

Requirements to Cancel a Call

Two requirements must be met to cancel a call. The system makes the same checks if you cancel an individual line.

Open MOs

Open MOs cannot be attached to the call. If you associated an MO with the call, you can only cancel it when all quantities on the MO are either consumed or returned, or an error displays.

No Reports

No reports can exist for the call. An error displays even if no detail has actually been recorded. If no service is required for a call and a report has been opened, you can manually close the report and close the call, but you cannot cancel it.

Placing a Call on Hold

You can place any call on hold. When a call or call line is on hold, you can record activity for it only after you change its status. MOs cannot be ordered for it. In addition, an invoice cannot be generated in CAR. Since you may want to invoice for activity already recorded for a call on hold, you can generate an invoice in Call Invoice Recording, but a warning displays.

When placing a call on hold, you are warned if any of the following conditions exist.

Open MOs

A warning displays if an MO is attached to the call with quantities that are neither consumed nor returned.

Incomplete Report Transactions

If detail has been recorded in Call Activity Recording, the system warns you if all inventory has not been successfully issued. The system also warns you if all labor and expense transactions have not been posted to the proper GL accounts.

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